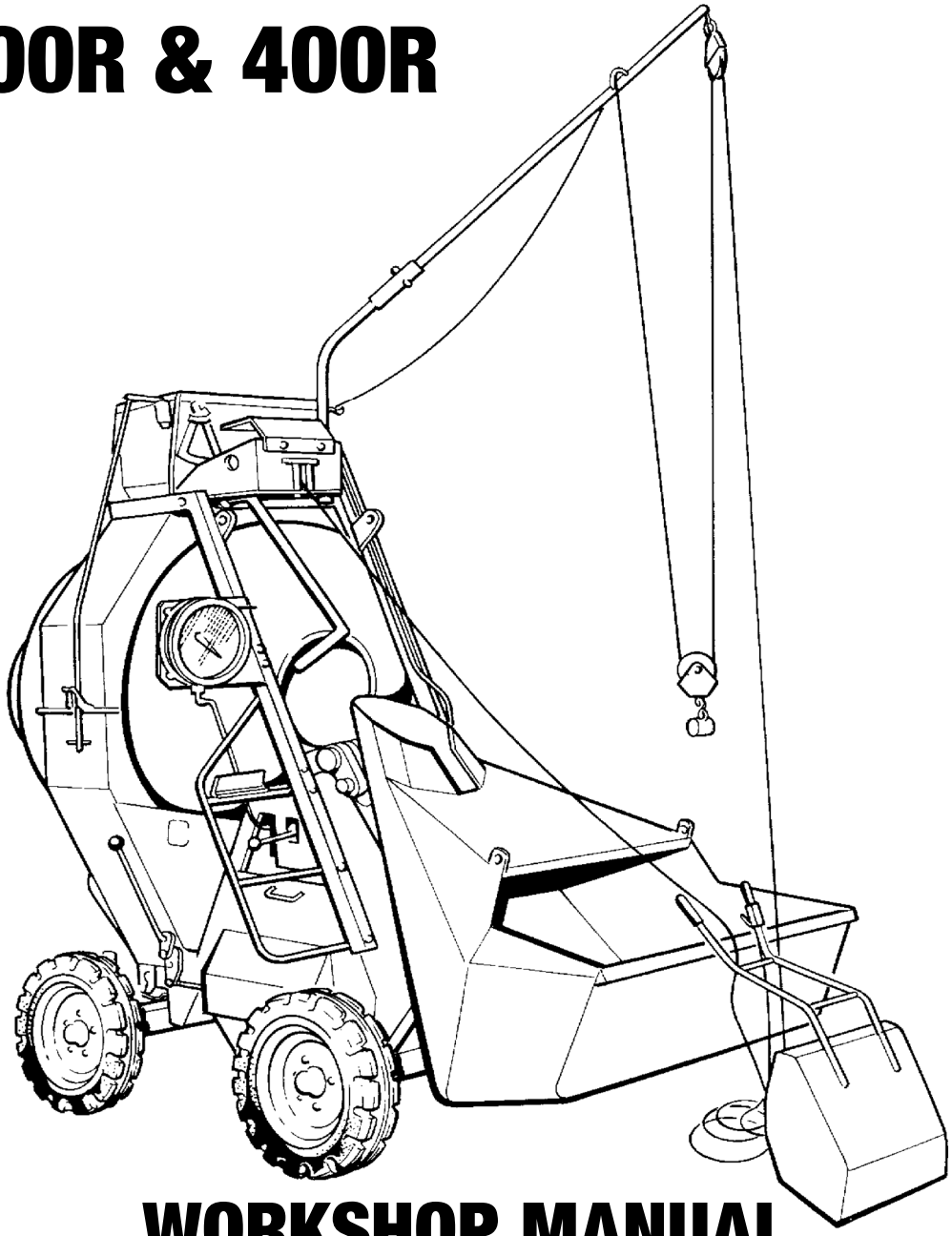
WINGET

300R & 400R



WORKSHOP MANUAL

WINGET LIMITED
PO BOX 41
EDGEFOLD INDUSTRIAL ESTATE
PLODER LANE
BOLTON
LANCS
BL4 0LS
Tel:-++ 44 (0) 1204 854650
Fax:- ++ 44 (0) 1204 854663
service@winget.co.uk
parts@winget.co.uk
www.winget.co.uk

ISSUE 8 2012

WORKSHOP MANUAL

300R 400R

WINGET REVERSING DRUM CONCRETE MIXERS

ISSUE 8 2012

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IMPORTANT Engine Change

From mid 2004 the Lister Petter TS2 and TS3 engines were replaced by the Lister Petter TR2 and TR3 engines. The TR range of engines is completely interchangeable with the TS range and consumable items such as filter elements are identical. There are some internal component differences and when ordering spares it is important to state whether it is a TS or TR engine.

Instructions and notes found throughout this manual which refer to TS engines are also applicable to the TR engine

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SECTION 1
INTRODUCTION

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Introduction

The following procedures should enable experienced service personnel to strip, repair and rebuild Winget 300R and 400R Reversing Drum Concrete Mixers in a safe and competent manner. The procedures are not intended to be used by personnel who are unfamiliar with the product nor mechanically inexperienced.

It is assumed that personnel are aware of Health and Safety Regulations which should be applied to all working practices, but the following should act as a reminder.

Ensure all work tools are in good condition.

Always wear Safety Spectacles when using Soft or Hard Faced Hammers, Chisels or when using Air Tools. Wear Safety Spectacles when cleaning hardened concrete or mortar off components.

Do not misuse Air Lines and be aware of the damage Compressed Air can cause if misused.

Always make sure lifting equipment is in good condition and the Safe Working load exceeds the weight of the components to be lifted.

Oils, Fuels, Silicone Sealers and Open Gear Lubricants can cause skin diseases if allowed to contaminate the skin. Always apply barrier creams, wear suitable protective clothing, or when contamination is unavoidable clean the area with soap and water as soon as possible. Do not use thinners or other solvents to clean skin.

Health and Safety is a matter of common sense. If common sense is applied correctly Health and Safety can be improved and the risk of accidents reduced.

Refer to the Parts Listings in Section 10 or the Parts & Operators Manual for a guide to the correct sequence for assembling components and sub assemblies.

It is assumed for the purposes of this manual that the machine is standing on firm level ground and is horizontal in both planes.

Left hand and Right Hand views are taken when looking directly at the Feed Hopper.

Whilst every effort is made to ensure the contents of this manual are accurate Winget Limited accept no responsibility for errors or omissions and reserve the right to alter specification without prior notification in which case certain sections may then no longer apply.

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SECTION 2

REPAIR & SERVICE PROCEDURES

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Lifting Points

Lifting Points capable of supporting the weight of the Mixer are incorporated in both of the Water Tank Supports just below the height of the Drum Top Guard.

The Lifting Points are highlighted with an ISO 'Hook' symbol adjacent to each Point.

On Military/Nato mixers the Lifting Points are also painted white.

The Hopper also incorporates Lifting Points to assist in removing the Hopper. The L/H Point is used to secure the Hopper Safety Chain which is attached to the raised Hopper during maintenance work. The Hopper Lifting Points are not highlighted to avoid confusion with the main lifting points. On no account must the Hopper Lifting Points be used to support the weight of the mixer.

Drawbars – Standard & Military/Nato

The Drawbars are retained to the Front axle by two 'L' shaped retaining pins which are in turn secured by two lynch pins c/w chains which are inserted through the retaining pins once the drawbar is in position. To remove the drawbar first remove the lynch pins, withdraw the retaining pins and lift the drawbar clear, refit the retaining pins and prevent their loss by refitting the lynch pins. Reverse the procedure to refit the drawbar.

Military/Nato Towing Eye (Used with Military/Nato Drawbars)

Remove the split pin, castle nut and flat washer retaining the eye in the drawbar. Remove the eye. To refit reverse the above procedure, do not fully tighten the nut, allow the eye to rotate in the drawbar. New eyes will require drilling for the split pin when fitted in place.

Jack Legs

To remove a Jack Leg either jack up and support the machine or using suitable lifting equipment lift the machine. Pull out the retaining pin remove the leg. Refit in the reverse order.

Military/Nato machines have an additional security measure in the form of a lynch pin through the jack leg retaining pin to prevent the jack leg dropping unintentionally.

Anti-Bounce Bracket

An Anti-Bounce Bracket is fitted between the L/H side of the Hopper Cradle and Mainframe whilst transporting the mixer to prevent the Hopper bouncing and causing damage to the Batchweigher Loadcell and other components.

One end of the Hopper Anti-Bounce Bracket is bolted to the Hopper Cradle, the other end is retained by the Jack Leg retaining pin.

To remove the Hopper Anti-Bounce Bracket, start the engine and raise the Hopper very slightly to release its weight off the bolt and jack leg retaining pin (it is normal for the Hopper to settle slightly during transportation).

Remove the bolt, pull out the pin and lift the Anti-Bounce Bracket clear. Refit in the reverse order.

On no account must attempts be made to fully raise the Hopper whilst the Anti-Bounce Bracket is in place.

Pneumatic Wheels, Stub Axles, Hubs

The complete Wheel, Stub axle and Hub assemblies are retained to the axles by four bolts, two positioned vertically and two horizontally. To remove the assemblies, support the machine on the jack legs, remove the bolts and lift the assemblies clear. If fitted take care not to lose the tapered washers. Reverse the procedure to refit.

Wheels – Pneumatic

To change a wheel, first slacken the five nyloc nuts, jack up the machine supporting the weight on a jack leg. Remove the nuts and wheel. To refit, reverse the procedure.

Hubs

Remove the wheel as described previously. Knock off the dust cap. Remove the split pin and nut, pull off the hub assembly complete with bearings and oil seal. Knock out the bearings and oil seal clean the hub and shaft. Pack the new bearings with grease. Fit the new bearings and oil seal into the hub. Coat the shaft with copperslip, push the hub complete with bearings onto the shaft. Fit the flat washer and castle nut and tighten the nut. Back off until the wheel spins freely with no end float. Align the nut with the cross drillings in the shaft, fit the split pin. Refit the wheel as described previously.

Steel Wheels, Stub Axles and Hubs

To remove the complete assembly refer to Pneumatic Wheels, Stub axles and Hubs.

Wheels – Steel

Steel wheels are retained to simple stub axles using a collar retained by a single cross bolt. To remove the wheel, jack up the machine, remove the bolt, remove the collar and lift the steel wheel clear. Reverse the procedure to refit coating the shaft, bore of he steel wheel and collar with copperslip.

Front Axle and Pivot Bracket

To remove the axle or pivot bracket, support the front of the machine and fully raise the jack legs. Remove the drawbar, stub axles, hubs and wheel assemblies as described previously. Remove the split pins and washers retaining the tie bar between the axle and mainframe, support the axle and remove the tie bar, remove the split pins, and washers though the pivot pin, knock out the pin. Remove the supports and lift the axle clear of the pivot bracket. The pivot bracket may be held in place by either a split pin and washer or nut and bolt. Reassemble in the reverse order coating pins etc. with copperslip, replacing damaged split pins.

Water Tank Removal (Where fitted)

Turn off and disconnect the water supply. Remove the split pin and disconnect the operating rod. Unbolt and remove the outlet pipe. Unbolt the tank and using suitable lifting equipment lift the tank clear of the mainframe. Refit in the reverse order.

For an explanation of the Water Tank operation and repair instructions see page 29.

Flowmeter Removal (Where fitted)

The Flowmeter is mounted on a bracket on the L/H side of the mainframe and is connected to the inlet pipe at the drum charge mouth by a 1.5 bore rubber hose. The meter is a mechanical device featuring a reset facility and includes a water on/off valve and an inline strainer which is removable for cleaning. To Remove the Meter disconnect the rubber hose by either slackening one of the hose clamps or removing one of the threaded connectors, remove the two ‘U’ bolts securing the meter in place and lift the meter clear. Reverse the procedure to refit. Note:- the meter itself contains no user serviceable components.

Drum Edge Rollers

Where fitted remove the water tank as previously described. Support the front of the drum to prevent it falling forward suddenly when the Edge Roller assembly is removed.

Release the adjusting screw then unbolt and remove the edge roller assembly taking care not to lose the shim packers. Remove the setscrews holding the rollers into the housing and remove the rollers. Support the rollers in a soft jawed vice remove the

circlips and using a suitable drift, knock the shafts through the bearings and out of the rollers. Drift the bearings out of the rollers. Using a sharp instrument remove the seals from the new bearings and pack the bearings with clean good quality grease, replace the seals.

Reassemble in reverse order taking care not to forget the 'V' seals. When assembling the rollers back into the housing do not fully tighten the setscrews until the assembly has been refitted and final adjustment carried out.

Refit the assembly onto the drum housing. Adjust the height of the assembly using the shims so the rollers do not foul the drum circumference and the drum gear ring will not foul the assembly.

Adjust the rollers against the track ring so that a total 1.5mm clearance exists between the rollers and ring. Tighten the setscrews. Lock the adjusting screws with locking wire.

Note:

Incorrectly setting the rollers in relation to the track ring will result in premature bearing failure and/or excessive wear of the track ring and idler rollers.

As a final check that all adjustments are correct remove the support from below the drum, engage either forward or reverse drive and crank the engine rotating the drum checking visually that neither a foul condition nor tight rollers exist.

If removed refit the water tank assembly.

Drum Removal

It is necessary to remove the Drum for replacement of the Drum Gear Ring it is also strongly recommended that the Drum is removed if repair or replacement of the Idler Rollers is necessary.

Remove either the Water Tank or Flowmeter and Water Inlet Pipe and Drum Edge Rollers as described previously.

On machines fitted with a Dragline remove the Mast and Cable. Disconnect the Wire Rope from the Shovel and wind back onto the Winch Motor. Mark for identification purposes the hoses to the Winch Motor and disconnect both the hoses from the Motor. Fit blanking caps and plugs to both the hoses and Winch motor adaptors to prevent the ingress of foreign matter. Disconnect the Electrical Cable and using suitable lifting equipment support the Dragline Winch Motor Bracket, remove the retaining setscrews and nuts and lift the assembly clear. Where a Batchweigher is fitted unbolt the Gauge from the left hand Water Tank Support and stow in the Mainframe (Do not disconnect the small bore pipe).

Release the Engine/Fuel Tank Cover from the Right Hand Water Tank Support, if a UK step is fitted, separate the top step from the rest of the step assembly.

Unbolt both Water Tank Supports and lift clear using suitable lifting equipment.

Unbolt and lift off the Drum Top Guard.

Attach suitable lifting gear to the Drum Assembly (The Drum weighs approximately ¾ tonne when clean) and lift out of the Mainframe. It may be necessary to remove the Drum Mouth Extension to allow attachment of the lifting equipment.

Reassemble in reverse order, following the instructions for adjusting the Drum Edge Rollers.

Drum Gear

Remove the Drum as described previously. Stand the Drum Assembly on the charge mouth. Remove the Socket Headed Capscrews securing the Gear to the Drum. Using suitable lifting equipment lift the Gear clear of the Drum.

Drum Cone Extensions

The various mouth extensions either Standard Steel Cone, Steel Extension Cone or Rubber Extension Cone bolt to the Drum mouth. Removal is simply a matter of removing the ring of bolts and lifting off the mouth extensions.

Drum Blades

Drum Blades can be changed with the Drum in Situ. The Blades are bolted in place and if the Drum interior is clean replacement is fairly straightforward although two pairs of hands are necessary. Unbolt and discard the old Blades and bolt the new Blades in their place using new bolts.

Take care if using oxyacetylene cutting equipment to remove corroded bolts for the concrete can “explode” violently spitting pieces of concrete. Wear suitable safety goggles or spectacles. Do not breathe in the fumes generated by the cutting or burning process, ensure the drum is well ventilated and wear suitable air fed breathing apparatus.

Idler Roller Non Drive R/H

Whilst it is recommended that the Drum is removed to enable the Rollers Assemblies to be replaced It is possible to remove the Rollers with the Drum in situ provided care is taken.

Remove the Water Tank or Flowmeter and the Edge Rollers as described previously.

Remove the Inspection Covers from each side of the Drum Housing. Block up the Drum taking the weight off the Roller Assemblies or support the weight of the Drum using suitable lifting equipment.

Remove the Stop Bar, unbolt the Rear Carrier Bracket, remove the nuts and washers from the bolts securing the Front Carrier Bracket but do not remove the bolts which are supporting the Front Bracket and preventing the complete assembly dropping into the Drum Housing.

Carefully manoeuvre the Roller Assembly through the access hole, the assembly is quite heavy and extra hands or suitable lifting equipment are recommended. Take care not to lose the Shim Pack.

Remove the bolt securing the Rear Carrier and the grubscrew securing the Front Carrier remove both from the shaft.

Remove the eight setscrews holding the Oil Seal Housing/Bearing Retainer to each side of the Roller.

Support the Roller and using a suitable soft faced hammer knock the shaft and bearings out of the Roller. Secure the shaft in a soft jawed vice and remove the bearings off the Shaft. Using a sharp instrument remove the seals from the new bearings and pack the bearings with clean good quality grease, replace the seals.

Fit a new Bearing to the longer front shank of the Shaft and using a suitable bearing tube seat the Bearing and Shaft in the front of the Roller (small diameter) until the Bearing is flush with the face of the Roller. Fit a new Oil Seal to the Bearing Retainer and secure in place on the Front of the Roller. Turn the roller over. Using a suitable bearing tube fit the Rear Bearing to the shaft and into the Roller until the Bearing is flush with the face of the Roller. Fit a new Oil Seal to the Bearing Retainer and secure to the Roller.

Refit the Front and Rear Carrier Brackets. Using suitable lifting equipment, lift the Roller Assembly back into the Mainframe, loosely secure the front Carrier to the Mainframe with the four nuts, bolts and washers. Insert the Shim pack under the Rear Carrier and Shim the Roller and Shaft until it is horizontal.

Place a straight edge across the rear face of the Roller and ensure it is square with the opposite roller. Tighten the retaining bolts. Refit the stop bar. Remove the Drum supports and lower the Drum back onto the rollers.

Refit the Edge Rollers and Water Tank or Flowmeter as described previously. Run the mixer, checking operation of the Drum. Coat the Rollers/Gear with open gear lubricant. Stop the engine. Replace the inspection covers.

Idler Roller/Drum Drive Pinion L/H

Whilst it is recommended that the Drum is removed to enable the Roller Assemblies to be replaced it is possible to remove the Rollers and Drum Drive Shaft with the Drum in situ provided care is taken.

Remove the Water Tank or Flowmeter and the Drum Edge Rollers as described previously. Remove the Inspection Covers from each side of the Drum Housing. Block up the Drum taking the weight off the Roller Assemblies or support the weight of the Drum using suitable lifting equipment.

Remove the Chain Cover, Drive Chain and Upper Sprocket as described on page 11. Remove the Stop Bar, unbolt the Plummer Block and Bearing Assembly, remove the nuts securing the front Bearing Carrier/Housing but do not remove the bolts which are supporting this housing and preventing the complete assembly dropping into the Drum Housing.

Carefully manoeuvre the Roller Assembly through the access hole, the assembly is very heavy and it is recommended that either an additional pair of hands or suitable lifting equipment are used. Take care not to lose the shimpack.

Remove the Grub Screw and remove the Plummer Block and Bearing off the rear of the Shaft. Remove the Front Bearing Carrier/Housing off the shaft and retrieve the spacer. Using a soft faced hammer knock the cast Drive Pinion off the shaft, remove the Parallel Key and “V” Seal.

Following the procedure for the R/H Idler Roller, strip and rebuild the Roller Shaft and Bearing. Not forgetting to remove the seals from the new bearings and pack the bearings with clean good quality grease and replace the seals.

Refit the Plummer Block and Bearing to the rear of the Shaft lock the Grubscrew.

Fit the “V” Seal and Parallel Key to the shaft. Slide home the cast Drive Pinion and spacer. Clean all traces of silicone sealer from the front Bearing Housing/Carrier and Mainframe mating surfaces. Refit the Housing to the Shaft. Apply a bead of silicone to the housing face.

Lift the Roller Assembly back into the Mainframe loosely securing the front Carrier/Housing. Insert the Shim Pack below the Plummer Block and Bearing shim the Roller and Shaft until it is horizontal.

Place a straight edge across the rear face of the Roller and ensure it is square with the opposite roller. Tighten the retaining bolts. Refit the Stop Bar.

Refit the Upper Drive Sprocket, Drive Chain and Chain Cover as described previously.

Remove the Drum supports and lower the Drum back onto the Rollers.

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Refit the Edge Rollers and Water Tank or Flowmeter as described previously. Run the mixer, check the operation of the Drum coating the Rollers/Gear with open gear lubricant. Stop the engine and replace the inspection covers.

Drive Chain Adjustment

The Drive Chain is located behind the cast cover on the front of the Mainframe. The cover contains an inspection aperture through which the Chain Tension can be checked. The Tension is correct when the chain deflects 8mm-12mm mid way between the sprockets.

To adjust the chain, remove the Inspection cover on the L/H side of the Drum Housing. Slacken the three nuts on the lower Bearing Bracket, do not slacken the nuts too much

to avoid oil leaks following chain adjustment. Using the adjusting screw above the Bearing Bracket increase or decrease tension on the chain as necessary. Lock up the nuts. Replace the Inspection Covers.

Drive Chain/Sprocket Replacement

Drain the oil from the Chain case. Remove the setscrews and lift the Cast Chain Cover from the Mainframe. The joint between the Chain Cover and Backplate/Mainframe is made with Silicone Sealer and the Cover may require gently prising from the Mainframe.

Slacken the Adjustable Bearing Bracket as previously described to release the Chain Tension. Disconnect the Chain split link and remove the Chain.

To remove the upper sprocket cut the locking wire, remove the special screws and retaining washer, pull of the sprocket. Take care not to lose the key. In some cases it may be necessary to use a suitable two legged puller.

To remove the Lower Sprocket remove the Circlip and Grubscrew. Pull off the sprocket taking care not to lose the key. In some cases it may be necessary to use a suitable two legged puller.

Reassemble in the reverse order taking care when refitting the lower sprocket that the shaft is not moved backwards.

Re-tension the Chain as previously described on page 10.

Ensure the joint faces on the Cover and Backplate are clean. Apply a generous bead of Silicone Sealer to the Cover, allow the sealer to cure for a few minutes then refit the Covers.

Top up the oil through the inspection aperture and refit the cover plate.

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Start the engine, running the drive train checking for unusual noises.

Adjustable Bearing Bracket/Lower Drive Shaft

Remove the Chain Cover, Drive Chain and Lower Sprocket as described above. Remove the L/H inspection cover, disconnect the Propshaft between the Gearbox and Lowe Drive Shaft. Release the adjusting screw above the Bearing Bracket remove the nuts from the three studs securing the Bracket and carefully pull off the Bearing Bracket taking care not to damage the gasket. If damaged the gasket must be replaced.

The Bearing Bracket is sealed to the Mainframe using a thick gasket which is coated with silicone sealer on assembly. Clean all traces of jointing materials from the Mainframe and Bearing Bracket.

Remove the Drive Shaft from the Bracket, pull the Thrust Washer and “V” Seal of the shaft. Using a suitable Bearing tube and a soft faced hammer knock the Needle Roller Bearings out of the Bracket.

Reassemble the Bearing Bracket assembly fitting new bearings, place the Thrust Washer and “V” Seal on the Shaft. lubricate the shaft and push the Shaft home into the Bracket. Ensure the mating surfaces of the Bracket and Mainframe are clean and apply Silicone Sealer to both surfaces, allow the Silicone to cure for a short time then apply the gasket to the Bracket and apply a bead of Silicone Sealer to the gasket. Take care when fitting the Bracket not to damage the gasket. Refit the Propshaft.

Following the procedures described previously fit the Lower Sprocket, Drive Chain and Chain Cover. Take care when adjusting the chain not to damage the gasket. Top up the Chain Case oil and refit the inspection cover.

Chain Case Back Plate

Remove the Chain Cover, Drive Chain, Upper and Lower Sprockets, Propshaft and Adjustable Bearing Bracket as previously described. Remove the nuts securing the three lower studs into the Back plate. Remove the four nuts, bolts and washers securing the Upper Drive Shaft Bearing Carrier to the Mainframe and Back plate.

Prise off the Back plate and remove all traces of old sealing compounds from the Mainframe, Back plate and Bearing Bracket. If a new Back plate is to be fitted change over the three studs.

Apply a generous bead of silicone sealer to the rear face of the Back plate paying particular attention to the various holes in the Back plate. Allow the silicone to cure slightly then refit the Back plate. Once in place it is important that the Back plate is disturbed as little as possible throughout the reassembly stage to avoid oil leaks when the Chain Case is refilled with oil.

Refit the Adjustable Bearing Bracket, proposhafts, Lower and Upper Sprockets not forgetting the bolts securing the Bearing Carrier Drive Chain and Chain Cover.

Top up with oil, run, test the mixer and check for oil leaks.

Drum and Gearbox Controls

Hand Lever

The Hand lever pivot is retained on the inside of the Drum Housing with a split pin and washer, removal of the Hand lever will allow replacement of the pivot bushes, (which should be reamed to size following replacement) and the Roller and Bush.

Slotted Operating Lever

The Slotted Lever is retained to its pivot via a circlip and flat washer. To renew either the Lever or its Bushing remove the Handlever as previously described, disconnect the Connecting Rod, remove the Circlip and Washer, pull off the Lever. If the Bushing is renewed it will require reaming to size.

Reassemble in reverse order.

Connecting Rod

Disconnect the Spherical Bearing at the end of the Connecting Rod from the Slotted Lever, remove the locknut and adjusting nut from the other end of the rod. Carefully pull the Rod through the Long Sliding Gland, Clevis Block, Spring, Sleeve and Short Sliding Gland. Remove the second adjusting nut and locknut. Remove the Spherical Bearing.

Reassemble in the reverse order.

Drum Clutch Adjustment

Set the Handlever in the Mix/Charge position and rotate the nut on the Connecting rod to allow 3mm of the Short Sliding gland to protrude beyond the end of the Clevis Assembly, lock up the locking nut.

Repeat this operation in the Discharge position and rotate the nut on the Connecting Rod to allow 3mm of the Long Sliding gland to protrude beyond the end of the Clevis Assembly, lock up the locking nut.

Gearbox Removal

Disconnect the Connecting Rod as previously described.

Disconnect and plug the pipework and fittings at the Hydraulic Pump. Split the Driveshaft between the Engine and Gearbox at either the Twiflex or toothed drive coupling. Unbolt the

Gearbox from the Mainframe, using suitable slings and lifting equipment lift the Gearbox clear of the Mainframe.

Reassemble in reverse order ensuring the centreline of the Engine and Gearbox are in line by shimming as necessary to avoid straining the Couplings and Flanges.

Engine Removal

On Electrical Start Diesel and machines fitted with a Dragline and Alternator, isolate the Battery and disconnect the wiring. Split the Driveshaft between the Engine and Gearbox at either the Twiflex or toothed drive coupling. Unbolt the Engine from the Mainframe, disconnect the Air Cleaner pipework. Using suitable lifting equipment lift the Engine clear taking care not to lose the two engine packers. (Note later 'CE' machines are fitted with guarding over the propshaft.)
Reassemble in the reverse order ensuring the centreline of the Engine and Gearbox are in line by shimming as necessary to avoid straining the Couplings and Flanges.

Air Filter

The Air Filter is located on the Engine/Fuel Tank Shroud on the R/H side of the mixer.

During operation dust collected the body is ejected through the rubber valve in the side of the filters cylindrical body. The Element, which should be removed daily for cleaning and replaced at least once every 300 hours or three months is retained in the main body by a large wing nut, which when released allows removal of the element for cleaning.

Hydraulic Tank

The Hydraulic Tank contains a Suction Filter suspended below the Tank Lid. To access, clean any debris from the top of the tank, disconnect the Hydraulic Pipework from the Tank Lid, plug all hoses and blank off all fittings, remove the screws and carefully lift off the Lid to avoid damaging the lid seal. Unscrew and clean the filter.

Reassemble in reverse order ensuring the seal between the Lid and Tank Body is in good condition.

Oil Draining

The oil drain plug is located centrally in the base of the Hydraulic Tank and can be accessed from below the machine.

To drain the oil run the engine and circulate the oil through the system until warm. Stop the engine and remove the Tank Lid as described above. Place a collection tray below the Tank, remove the plug and allow the Tank to drain completely. Clean out the Tank and refit the drain plug. Refit the Lid. Top up the oil until the oil is level with the tip of the cone at the base of the oil filler neck. Run the engine, operate the Hopper and Dragline

Controls. Stop the engine and allow the oil in the Tank to settle for approximately two minutes before rechecking the level.

Note:

The Hydraulic Systems holds approximately 22 Litres (5 gallons) of oil.

Located on the top of the tank is the Bleed Valve which allows oil discharged from the single Acting Hopper Ram (as the Ram lowers the Hopper) to bleed back into the tank.

If replacing the Bleed Valve body, ensure that the Ball in the Body forms a good seat by driving the Ball down on the seat using a soft faced punch.

The tank is retained in the Mainframe by three M10 setscrews, however it is not possible to remove the Tank unless the Gearbox is first removed.

Hydraulic Pump

The Hydraulic Pump is located on top of the Gearbox secured by four setscrews and is driven through the Gearbox Bevel Gears, via a Pump Mounted Bevel Pinion. If replacing a Bevel Pinion on the pump be aware that many pumps have more than one keyway cut into the tapered shaft, selecting the wrong keyway will result in premature shearing of the key.

Hydraulic pumps should be shimmed to give 5-8 Thou (0.02-0.20mm) gear backlash.

Place the Pump Assembly onto the Gearbox without any shims and measure the gap between the pump body and gearbox casting. Add 5-8 thou (0.02-0.20mm) to the measurement obtained and select the correct number of shims.

Hydraulic Control Valve

The Hydraulic Control Valve is mounted on the L/H side of the machine below the step being secured to its bracket by at least two bolts, nits and washers.

Lifting the control lever raises the Hopper whilst lowering the lever lowers the Hopper.

The Control Valve powers the Single Acting Hydraulic Ram and also provides oil for the Dragline Winch Motor via a High Pressure Carryover located in one of the control valves ports. The adjustable system relief valve is located in the Control Valve and apart from a spool seal kit no and handle kit no other user serviceable parts are available.

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Hopper Ram & Restrictor

Lift the Hopper and support with the Safety Chain provided.

Disconnect the ¼ bore hose leading from the Header Tank to the Ram cylinder and plug the hose to prevent oil loss. Remove the bolt retaining the Upper Pivot Pin through the Hopper Cradle and knock out the pin. Do not lose the Washers placed each side of the Ram Eye. Allow the ram to drop forward, the upper eye bush is now visible and can be replaced if necessary. When replacing the upper bush with the ram in situ it is important that the ram is prevented from moving from side to side. When fitting a new bush ensure the lubrication hole in the bush is aligned with the grease nipple.

To remove the Ram Assembly, disconnect and plug the Hydraulic Hose and the Restrictor on the Ram port. Remove the bolt retaining the lower pivot pin through the Mainframe. Support the Ram with suitable lifting equipment and knock out the lower pin.

Lift the Ram Assembly clear drain out any oil and support in a suitable soft jawed vice. Clean the area around the end cap and attaching a suitable tool unscrew the end cap, carefully remove the rod and piston assembly and secure in a soft jawed vice.

Examine the cylinder bore carefully for signs of scoring or corrosion and the piston rod for signs of pitting or peeling, it is pointless attempting to reseal a ram which has a damaged bore or rod.

Remove the split pin securing the Piston Nut and remove the Nut, Piston Assembly and End Cap. Remove and discard the old seals, new seals should be soaked in clean hydraulic oil before fitment. Ensure all components are clean. Fit the new seals, rebuild the Ram in reverse order fitting a new split pin through the piston retaining nut.

The Restrictor screwed into the Ram Inlet/Outlet port restricts the flow of oil out of the Ram as the Ram is closed ensuring a more controlled descent.

The Restrictor contains a spring and Poppet valve and does not usually cause problems in service.

Note:

The Hydraulic Ram is single Acting and in operation when the Ram is closed the majority of the Hydraulic Oil is discharged from the full bore side of the Ram. To avoid condensation forming in the annulus (upper) side of the cylinder as the Ram is closed, oil is drawn into the annulus side from the Header Tank to fill the void with oil, this oil is expelled back into the Header Tank as the Piston raises extending the Ram and lifting the Hopper.

The Header Tank contains a sight glass and it is important that the oil level within the Tank is checked on a daily basis. The oil level is correct if it is just visible in the sight glass when the ram is fully closed.

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Hose Failure Valve

Machines bearing the "CE" mark indicating compliance with the EC Machinery Safety Directive have a Hose Failure Valve fitted to the Ram Inlet/Outlet port in addition to the restrictor.

In service it is not unusual for violent operation of the Control Valve (In order to shake material free from the Hopper when the Ram is at the full extent of its stroke) to blow off the relief valve activating the Hose Failure Valve. Which then prevents closing of the Ram and lowering of the Hopper.

Should this occur, slowly lift the Hopper slightly by extending the Ram without blowing off the relief valve, then slowly close the Ram lowering the Hopper. Once the Hopper has lowered by approximately 300mm normal operation can be resumed.

If a new hose failure valve is to be fitted the valve should first be unscrewed from the body, and the gap between the valve baffles adjusted to 2mm by means of the small capscrew and nut. Following adjustment, the valve should be screwed fully home into the body and operation of the machine checked when it is fitted.

Hopper, Cradle, Link Arms and Pivot Shaft

Link Arms

The Hopper Cradle pivots on Needle Bearings contained within the "L" shaped Link Arms.

To remove the Arms lower the Hopper Cradle and block up the Hopper to prevent the assembly dropping when a Link Arm is removed.

Remove the Bearing Caps, each secured with three setscrews which pass through the Caps and Arms into the Bearing Housings. Remove the Nut and Flat Washer retaining the Link Arm to the Shaft, pull off the Arm, retrieve the Housings and "O" Rings from the Pivot Shafts.

Remove the Inner Bearing of the Shafts, using a suitable bearing tube and soft faced hammer remove the Outer Bearings from the Link Arm.

Reassemble in the reverse order greasing the Needle Bearings on Assembly.

Hopper Cradle and Hopper

Removal

Raise the Hopper slightly to allow access to the Hopper retaining bolts and nuts, attach suitable lifting equipment to the Hopper, remove the bolts and carefully lift the Hopper clear.

Ref: SHSC1216

Attach the lifting equipment to the Hopper Cradle, raise the Cradle to allow removal of the upper Ram pivot pin, lower the Cradle. Remove both Link Arms and the Link Shaft which passes through the Cradle, lift the Hopper Cradle clear.

Reassemble in reverse order.

Pivot Shaft

The Pivot Shaft is retained in the "A" frame by two grubscrews one each end of the Shaft.

To remove the Shaft carry out the procedures describing removal of the Hopper, Link Arms and Cradle. Remove the Inner Bearings from the ends of the Shaft. Remove the grubscrews and using a soft faced hammer knock out the Shaft.

Reassemble in reverse order coating the Shaft with copperslip and ensuring the Shaft is central in the "A" frame before tightening the Grubscrews.

Batchweigher

The Batch Weigher Gauge is located on the L/H Water Tank Support and is mounted on rubbers to dampen vibrations. The Gauge is connected to the Loadcell which is located in the Mainframe below the Hopper Cradle via a hydraulic pipe.

The Loadcell and Gauge must be considered a sealed unit and on no account must the hydraulic pipe be removed.

Damage to the Gauge or Loadcell is most commonly caused by dropping a loaded Hopper onto the Loadcell, allowing an empty Hopper to free fall directly onto the Loadcell or filling the Hopper directly from a Site Dumper, Skid Steer Loader, Tipping Lorry or other similar equipment.

These cause high shock loadings which can loosen the Needle Pointer in the Gauge, damage the Loadcell seals, or cause the top half of the Loadcell to turn over at an angle.

Although the both Workshop Manual and the Operators Manual contains instructions for overhauling the unit, it is recommended that the Loadcell and Gauge Assembly are returned to Winget Limited whenever possible for repairs. Field service and repairs can often cause complications and accurate calibration of the Assembly cannot be guaranteed. Winget Limited can accept no responsibility should attempts be made to overhaul or repair the units.

Assuming the Loadcell and Gauge are in good condition the most common causes of inaccurate weighing are:-

1) Mixer not level

2) Hopper resting on ground or build up of waste material below Hopper. Ensure at least 50mm (2") clearance between the ground and Hopper.
3) Build up of material around the Hopper Cradle Link Shaft.
4) Worn Hopper Cradle Pivot Bearings.
5) Loadcell Striker guide fouling Mainframe or failing to rotate freely.
6) Worn Loadcell Striker Pin.
7) Failure to Re-Zero Batchweigher Gauge by means of the Zeroing knob on the side of the Batchweigher Gauge.

Batchweigher Adjustment

Should the Batchweigher require adjustment the following procedure should be carried out.

With the Loadcell Striker resting on the Loadcell, check the top of the Link Arms are horizontal to within 2-3mm, and the Link Shaft is clear of the holes on the Cradle, if not, adjust the packing below the loadcell.

Check the Loadcell Striker is resting centrally on the Loadcell button, if not, slacken the setscrew below the Loadcell and adjust its position, or slacken the grubscrews securing the Hopper Cradle Pivot Shaft to the "A" frame and move the assembly over. Tighten the screws following adjustment.

Check the Loadcell Striker is at approximately 25 degrees to the Hopper Cradle, if not, adjust by altering the Loadcell Striker packing between the Striker and Hopper Cradle.

Place known weights in the Hopper to check the Gauge reading progressively throughout its range.

To increase the Gauge reading at low loads, increase the amount of packing below the Loadcell.

To increase the Gauge reading at high loads, increase the amount of packing behind the Striker.

Loadcell Striker Guide

The Loadcell Striker Guide is mounted in the Mainframe just behind the Loadcell, and rotates on Needle Roller Bearings.

To remove the Guide, raise and support the Hopper. From inside the Mainframe remove the grubscrew retaining the Guide Pivot Pin. Knock out the Pin and Lift the guide clear.

Prise out the Seals and using a suitable bearing tube and soft faced hammer remove the Needle Roller Bearings.

Reassemble in reverse order coating the Pivot Pin with copperslip, and ensuring the Guide rotates freely and does not foul either side of the Mainframe.

Feed Apron

Two or Three Compartment Feed Aprons are designed to assist the flow of materials into the Hopper in conjunction with a Dragline.

The Feed Aprons consist of L/H and R/H side panels, Base Panel, Centre Dividers (one or two depending on the option chosen) Support Bar, Rubber Flap, (to prevent materials falling between the Hopper and Apron) and Rubber Retainer.

To assemble the Feed apron, place the Base smooth side up in front of the Hopper, lay the Rubber Flap on the Base and secure with the Retainer and countersunk screws.

Using a suitable support raise the Base so that the Rubber is approximately 520 millimetres (1'8") off the ground and the Base slopes back at an angle, bolt both Side panels in place. Remove the support so the weight of the Base is taken by the side Panels. Fit the Support Bar between the Side Panels and bolt the Centre Dividers in place.

Check that the Rubber Flap projects slightly out over the Hopper Mouth and that both are in line, stake the Feed Apron securely in place using the four picketing lugs, two on each Side Panel.

The Feed Apron can be extended backwards to separate aggregate by fitting boards into the ends of the Side Panels and Centre Dividers.

Dragline Electrical System

Two different electrical systems or method of power generation are utilised depending on the engine or electric motor fitted.

Hand Start Lister-Petter TS & Electric Motor

When a Hand Start Engine or Electric Motor are fitted, the Gearbox drives via a "V" belt a 12 volt automotive type Alternator. This is in turn connected via 2 core cable to a Panel Mounted Isolator Switch and Warning Light. A Battery (acting as a storage device for the Alternators output) mounted on the R/H side of the mainframe, through a Two Pin Plug and Socket to the Shovel Mounted Operating Button/Switch and on to the Dragline Solenoid Valve.

The most common causes of electrical failure are:-

1) Break in the two core cable between the Shovel mounted Button/Switch and the Socket and Plug mounted below the Winch Motor. (If the Cable is shortened do not reduce the length to less than 19.8 metres, 65 feet).

2) Dirty or loose electrical connections at the Plug and Socket, at the Solenoid Valve, at the Alternator or Battery.
3) Bad Earth Connections.
4) Worn or badly adjusted “V” Belt.
5) Worn or dirty Alternator Brushes.
6) Failure to turn on the Isolator Switch before starting the Engine or Motor.
7) Flat Battery.

Voltage/Setting Instructions

It is not possible to adjust the Voltage Setting but the voltage can best be measured at the Terminal Block on the Solenoid Valve.

Remove the Terminal Block, Connect a D.C. Voltmeter to the Terminal Block, operate the Isolator Switch and start the Engine or Motor. Depress the Shovel mounted Button/witch and note the voltage reading, it should not exceed 14.5 volts. If the Voltmeter indicates a negative reading or reads in the reverse direction interchange the Voltmeter leads.

Electric Start Lister-Petter TS

When an Electric Start Engine is fitted the Charging System built into the Engine provides the electrical power to operate the Dragline Solenoid Valve.

Power is taken from Terminal 2 on the Ignition Switch, through 2 core cable via a Plug and Socket through the Shovel Mounted Operating Button/Switch, back through the Plug and Socket down to the Dragline Solenoid Valve (See Wiring Diagram).

The most common causes of electrical failure are:-

1) Break in the two core cable between the Shovel Mounted Button/Switch and the Socket and Plug mounted below the Winch Motor (If the cable is shortened do not reduce the length to less than 19.8 metres, 65 feet).
2) Ignition Switch in the “Off” position.
3) Dirty or loose electrical connections at the Plug and Socket, the Solenoid Valve, Ignition Switch or Battery.
4) Flat Battery.
5) Charging System Failure (See Engine Workshop Manual).
6) Bad Earth Connections.

Voltage Setting Instructions

It is not possible to adjust the Voltage Setting but the voltage can best be measured at the Terminal Block on the Solenoid Valve.

Remove the Terminal Block, Connect a D.C. Voltmeter to the Terminal Block and start the engine. Depress the Shovel mounted Button/witch and note the voltage reading it should not exceed 14.5 volts. If the Voltmeter indicates a negative reading or reads in the reverse direction interchange the Voltmeter leads.

Dragline Winch Motor

The Dragline Winch Motor is mounted on a bracket which is supported across the Water Tank supports, the hydraulic motor itself contains no user serviceable parts and should be replaced in the event of failure. The motor and winch drum are protected by a removable cover which is retained by two setscrews and nuts.

Four replaceable Nylon or Steel Rollers are mounted directly in front of the Winch Motor and allow the Wire Rope to operate without damage. The Rollers are retained by long through bolts and self locking nuts which are removed to allow replacement of the rollers. NOTE:- The position of the rollers can be alternated to even up the wear on them and prolong their service life.

Operation of the Winch Motor is controlled by the Shovel Mounted Button/Switch via the Solenoid and Dragline Control Valves.

When correctly piped up the Winch Motor rotates in a Clockwise Direction to pull the Dragline Shovel in and freewheels in an Anti-clockwise Direction when the Dragline Shovel is being pulled out by the Operator.

If the hoses to the Winch Motor are disconnected they should be marked to aid identification and both the hose ends and fittings in the Motor plugged to prevent the ingress of dirt or foreign matter. The Dragline Winch Motor circuit is protected by a secondary ‘relief valve’ contained in the Dragline Control Block.

Refer to the Dragline Hydraulic System Description on Page 26 for further information.

Dragline Control Block

The Dragline Control Block is mounted onto and above the Solenoid Valve, and in conjunction with the Solenoid controls the hydraulic oil flow to the Winch Motor.

The Control Block contains no internal user serviceable components apart from a simple Relief Valve, the setting of which is altered by adding or removing Shim Washers to increase or decrease the Spring Setting which in turn increases or decreases the hydraulic pressure to the Dragline Motor.

Refer to the Hydraulic System Description for additional information.

Dragline Solenoid Valve

The Dragline Solenoid Valve contains no user serviceable parts, and if checks of the electrical system indicate it is faulty it must be replaced.

Oil leaks between the Valve and Control Block indicate the failure of the small 'O' rings which can be replaced following removal of the Solenoid Valve which is retained by four socket headed capscrews.

Refer to the Hydraulic System Description for additional information.

Hydraulic System Description

The Basic Hydraulic System is simple in design consisting of a gearbox mounted Hydraulic Pump, Main Hydraulic Tank onto which is mounted the Bleed Valve, the tank also contains the Suction Strainer. A Header Tank connected to the annulus side (full bore or upper) of the Hopper Ram with a drain hose to the main hydraulic tank. A Single Spool Control Valve and Single Acting Hydraulic Cylinder onto which the Flow Restrictor and Hose Failure Valve are also fitted. The Hose Failure Valves are only fitted to those machines intended for use within the European Community.

The Pump is driven by the gearbox drawing oil from the Tank through the Suction Strainer. The Pump delivers the oil to the Control Valve, if the Valve Control Lever is in the neutral position the oil is directed back to the tank through the tank return line. (When a Dragline is fitted the threaded adaptor on the tank is fitted with an additional Tee piece to allow for extra return lines)

When the Control Lever is raised to lift the Hopper, the Valve Spool directs the oil through the tank mounted Bleed Valve down to the Ram where it passes through the Hose Failure Valve (where fitted) and Flow Restrictor before operating the Cylinder.

The tank mounted Bleed Valve is designed to ensure that when the Hopper is fully lowered, no residual pressure remains in the circuit between the Cylinder and Control Valve which could affect the Batchweigher readings. The Bleed Valve contains a Ball

and Spring and is ported to allow oil to flow back into the tank. Oil flowing under pressure from the Control Valve to the Cylinder enters the top of the Bleed Valve and acts on the Ball which is depressed against spring pressure closing off the Tank Port thus directing oil to the base of the Cylinder.

If the Control Lever is returned to neutral during the lift or lowering cycle, the pressure created in the circuit between the Cylinder and Control Valve by the weight of the Hopper acting on the Cylinder, is sufficient to hold the Ball on the seat within the Bleed valve, preventing the Hopper from dropping. (Should the Hopper continue to drop the Ball/Seat within the Bleed Valve possibly requires attention).

If the Control Lever is operated to lower the Hopper, the weight of the Hopper displaces oil out of the Cylinder, pressure in the circuit is not sufficient to retain the Ball on its seat and oil returns to the tank via both the Bleed Valve and Control Valve.

When the Hopper is fully lowered the residual pressure in the pipework between the Control Valve and Cylinder is dispersed through the Bleed Valve, allowing the Hopper's weight to act fully onto the Batchweigher Loadcell.

The Header Tank connected to the annulus side of the Single Acting Ram is designed to ensure the cylinder is always full of oil preventing changes in climatic conditions causing the formation of damaging condensation. The oil level in the Tank can be checked on a daily basis when the Hopper is lowered via the sight glass built into the face of the Tank. The level is correct when it is just visible in the sight glass, should the tank be overfilled the excess oil will be returned to the Main Tank via the overflow/return pipe.

In service it is expected that over time oil under pressure will migrate from the full bore side of the cylinder into the annulus side, passing the piston seals as they wear. This migration will increase the level of oil in the Header Tank whilst at the same time lowering the oil level slightly in the Main Tank, once the oil in the Header Tank reaches a certain level the excess will return via the return/overflow pipe to the Main Tank.

Excessive topping up of the Header Tank may cause an increase in the oil level within the Main Tank, levels should be monitored on a regular basis and the levels reduced if necessary.

Dragline Hydraulic System

The Dragline Hydraulic System consists of a 12 Volt Solenoid Controlled Oil Distribution Block (otherwise known as the Dragline Control Block) containing an adjustable Relief Valve. A Hydraulic Motor is fitted to operate the Dragline Winch. The system is continuously supplied with oil whilst the engine is running via a High Pressure Carryover at the Main Control Valve.

When the 12 volt Solenoid is not energised, oil flow from the Main Control Valve is directed by the Distribution Block direct back to the hydraulic tank through the centre return line which terminates on the tank lid/cover. The supply and return hoses supplying oil to the Winch Motor from the Distribution Block are at the same time ported within the Block to form a closed loop enabling the Winch Motor to revolve freely with minimum resistance when the Dragline Shovel is manually pulled backwards by the operator.

When the 12 volt Solenoid is energised by operating the Shovel Button/Switch, the tank return is closed, the loop is opened and oil is directed to the Winch Motor which revolves reeling in the Dragline Shovel. Oil exiting the Winch Motor is returned to the Distribution Block where it is directed down the second return line through the tank mounted tee piece, back into the tank.

Should for any reason the Motor jam or seize in operation the Relief Valve in the Distribution Block should "Blow off" dumping the oil down the return line via the tee piece back into the tank.

Relief Valve Adjustment

Main Relief Valve

With the Engine or Electric Motor at rest and the Hopper fully lowered ensure no residual pressure remains in the hydraulic system by operating the hydraulic control lever a number of times. Check and top up the hydraulic oil level.

Disconnect the supply hose to the top of the Bleed Valve, attach a suitable tee piece to the Bleed Valve and reconnect the hose. Connect a Hydraulic Pressure Gauge to the tee piece. The gauge should preferably be a minimum of 75mm in diameter with a minimum scale reading of 3500 psi and should be attached to a length of two wire hydraulic hose C/W crimped adaptors which is long enough to reach to the operator's station by the Control Valve.

Start the Engine or Motor and allow to run until the oil is warm. Operate the Control Valve raising the Hopper to its maximum height until the relief valve 'blows off' note the maximum pressure recorded on the gauge, it should read 2000 psi (138 BAR) If the reading is higher or lower the Relief Valve requires adjusting. Lower the Hopper, stop the Engine or Motor and disperse any residual pressure as described above. If the Hose Failure Valve has 'locked out' the Ram follow the procedures described on page 17 to release.
Slacken the Relief Valve locking nut (some valves may be protected by a removable cap) and identify whether the Valve is adjusted by means of a screwdriver or hexagon key.

Start the Engine or Motor and raise the Hopper again to momentarily 'blow off' off the relief valve, noting the reading, release the Control Valve Lever to neutral and adjust the relief valve either clockwise or anti clockwise dependant on whether the pressure requires increasing or decreasing. Do not turn the valve more than ¼ turn each time an adjustment is made, after each adjustment 'blow off' the relief valve noting the pressure obtained until the correct pressure is recorded.

Lower the Hopper, stop the Engine or Motor, disperse any residual pressure and remove the gauge, hose and tee piece. Reconnect the supply hose directly to the Bleed Valve, clean up any oil spills and check the oil level within the tank. Top up if necessary.

Dragline Relief Valve

Check the Main System oil pressure as described above. Disperse any residual oil pressure. Identify and disconnect at the Dragline Control Block the feed hose from the Dragline Control Block upto the Winch Motor, plug the open end of the hose. Attach to the Dragline Control Block in place of the hose removed the hydraulic test gauge c/w

with length of hose but without the tee piece, this will form a 'dead head' within the circuit as the oil can go no further than the gauge.

Operate the Dragline Isolator Switch (handstart and electric machines only). Start the Engine or Motor, there should be no need to allow the oil to warm up as it should still be warm from the previous tests, momentarily depress the Switch /Button on the Dragline Shovel to 'blow off' the relief valve and note the reading on the gauge. Do not unduly hold down the Switch/Button, only depress long enough to obtain a reading then release otherwise a steep increase in oil temperatures will be experienced and damage may be caused to the hydraulic system.

The gauge should read a maximum of 1500psi (103BAR), to adjust stop the Engine or Motor and disperse any residual pressure. Identify the large hexagon on the side of the Dragline Control Block which is the head of the relief valve and carefully unscrew, withdraw the hexagon which incorporates the spring guide, the bonded seal, spring and poppet valve. Small flat washers are placed on to the spring guide to increase the tension on the spring thereby increasing the pressure, removing a washer will reduce the pressure. During initial manufacture one washer is placed on to the spring guide and this is usually sufficient but over time in service the spring may weaken and require additional washers adding. Add or subtract a washer as may be necessary, refit the relief valve assembly and repeat the procedures described above to recheck the pressure.

Failure to attain the required pressure may indicate a worn or sticking poppet valve or worn seat.

Water Tank Description

The Tank is designed to automatically shut off the flow of incoming water once the desired measured quantity (between 10-75 litres/2-16 Gallons) is achieved.

Mounted on the front of the Tank Body is a Graduated Scale and Carrier, passing through the Carrier is a Pointer and Pivot Pin. Once the Pointer is set to the required amount on the Scale the Pointer and Scale Carrier are locked together with a wing nut and coach bolt.

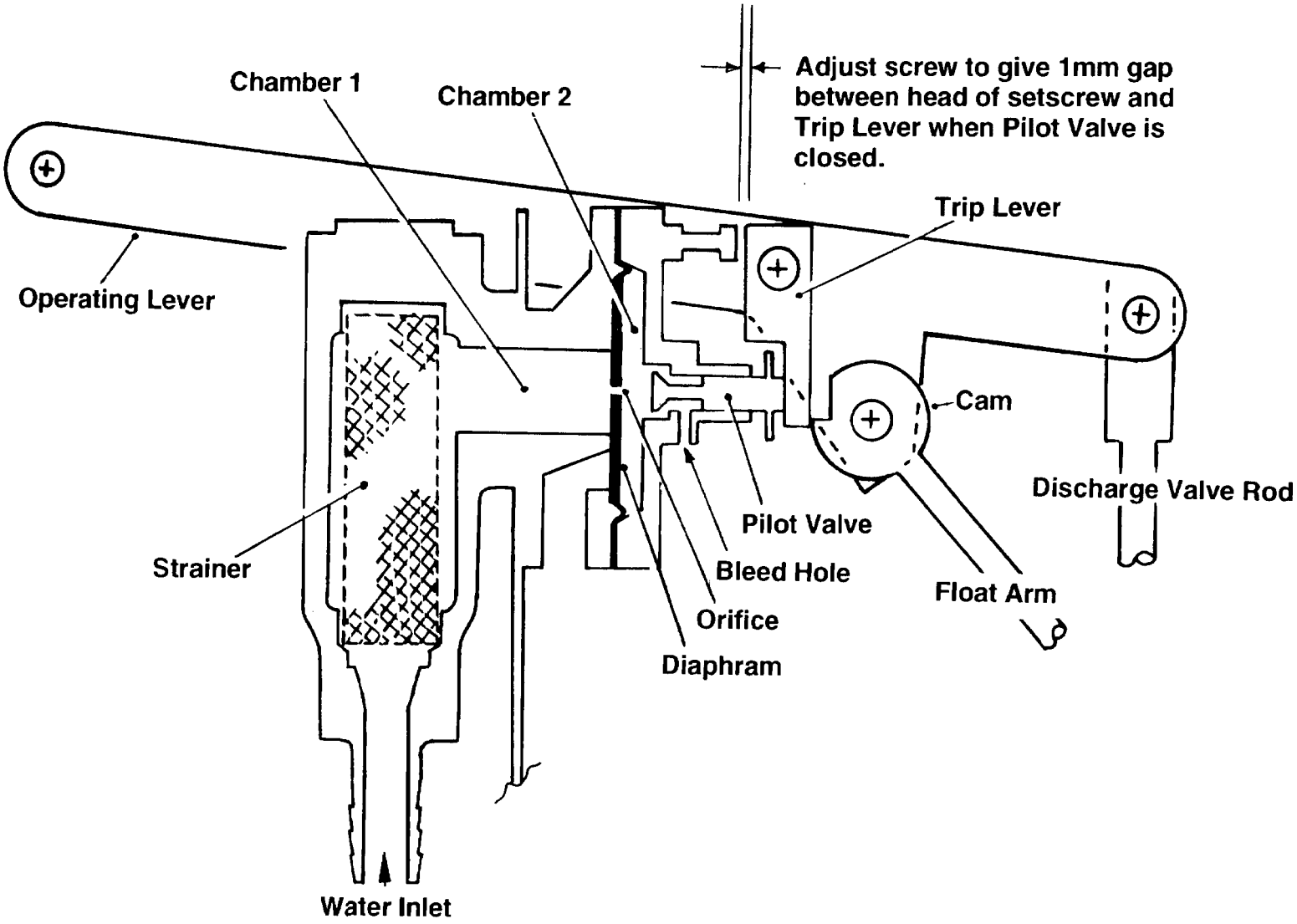
Both the Scale Carrier and Pointer Pivot Pin pass into the interior of the Tank where the Scale Carrier terminates in a Cam, the Pointer Pivot Pin carries the Float Arm and Plastic Float Assembly and terminates at the Operating Lever.

Moving the Pointer along the Graduated Scale effectively raises and lowers the height of the Float Assembly in the Tank.

Mounted on the outer L/H side of the Tank adjacent to the Scale Carrier is the Water Inlet containing the Water Strainer. Attached to the Water Inlet on the inner face of the Tank is the Water Inlet Valve assembly.

Ref: SHSC1216

WATER INLET VALVE
R RANGE MIXERS



The Water Inlet Valve consists of a Body and Cover sandwiching a Brass and Rubber Diaphragm. The Cover is machined to carry the sprung Pilot Valve.

Water enters the Valve Body through the Strainer filling the chamber acting on the rear rubber face of the Diaphragm, causing the Diaphragm to stretch and lift off its seat and allowing water to enter the Tank.

There is a “pin hole” orifice in the centre of the Diaphragm which allows water to pass through into a second smaller chamber in the Valve Cover where the Pilot Valve is located.

The Pilot Valve is held off its seat, against spring pressure, by the Trip Lever allowing the water to bypass the Pilot Valve and bleed into the Tank via a drilling in the Cover, thereby preventing water pressure building up in the second chamber. The Trip Lever is operated by the Cam located on the end of the Scale Carrier.

Water entering the Tank through the Inlet Valve very quickly reaches the level of the Float set by the Pointer which is locked to the Scale Carrier and Cam. The rising water level lifts the float/Pointer/Scale Carrier and Cam assembly causing the Trip Lever to “trip”, allowing the Pilot Valve to close preventing incoming water bleeding out of the second chamber.

Incoming water is still passing through the orifice but because it can no longer escape past the Pilot Valve, water pressure in the smaller second chamber increases equalling the pressure in the first chamber allowing the stretched Diaphragm to return to its original position, closing off the incoming water.

A seal is maintained by the Diaphragm against the first chamber due to the differential areas in the two chambers, i.e. the second chamber now has a greater effective surface area than the first chamber.

Pulling down on the Operating Lever opens the Discharge Valve in the base of the Tank discharging water into the Drum.

Pushing up on the Operating Lever closes the discharge Valve, resets the Trip Lever and opens the Pilot Valve allowing water to enter the tank once again.

The most common symptoms of Water Tank failures and their causes are:-

1) Reduced water flow – blocked Water Strainer or insufficient head of water or lack of water pressure.
2) Water leaking from the discharge Pipe – Worn or perished Discharge Valve Rubber Seat or corroded Valve.
3) Float failing to lift – punctured Float.

4) Water Flow failing to stop when Pilot Valve closed – ruptured Diaphragm, worn or perished Pilot Valve "O" ring, worn Pilot Valve, weak Pilot Valve spring or blocked orifice.
5) To high a water pressure causing the Diaphragm to rupture or stretch

Strainer Replacement

Turn off the water supply. Remove the hexagonal plug from the strainer body, lift out the strainer, clean or renew. Refit in reverse order sealing the threads of the plug with P.T.F.E. tape and threadseal. Turn on the water supply and check for leaks.

Diaphragm Replacement

Turn off the water supply. Remove the split pins retaining the trip Lever pivot pin through the Inlet Valve Cover, remove the binx nuts securing the pin to the Operating Lever and Scale Carrier Support. Slide out the pivot pin retrieving the Trip Lever.

Remove the eight setscrews (seven short, one long) holding the Valve Cover to the body retrieving the fibre or nylon washers. Lift off the cover and remove the Diaphragm. Clean out the Body and Cover.

Fit the new diaphragm, inspecting for damage, note the Brass Face should face the Pilot Valve. Reassemble the Valve, replacing any damaged Fibre or Nylon sealing washers. Do not overtighten the setscrews retaining the cover or the Diaphragm will not operate correctly and the fibre washers may split.

On completion adjust the long setscrew opposite the Trip Lever so that when the Pilot Valve is closed the gap between the head of the setscrew and triplever is 1mm.

Pilot Valve and "O" Ring

Follow the previous instructions under Diaphragm Replacement and remove the Inlet Valve Cover.

The Pilot Valve is retained in the Cover by a split pin, flat washer and Spring. Remove the Pilot Valve and "O" Ring. Reassemble in reverse order following the instructions under Diaphragm Replacement.

Float

Turn off the water supply. Loosen the locknut slightly and unscrew the Float. Fit the new Float in the same position on the Float Arm to avoid upsetting the Tank Calibration.

Discharge Valve and Rubber Seat

Turn off the water supply, drain and remove the Tank. Remove the Water Outlet Pipes from the base of the Tank retrieve the Rubber Seat.

Slacken the locknut slightly and unscrew the Discharge Valve Rod from the Connector attached to the Operating Lever, remove the Discharge Valve and Rod through the opening in the Tank base. Knock out the Roll Pin securing the Discharge Valve to the Rod.

Reassemble in the reverse order screwing the Discharge Valve Rod back to its original position in the Connector to avoid upsetting the Tank Calibration. Renew the plastic sealing washers on the Water Outlet pipe if damaged.

Water Tank Adjustment and Calibration

Following major overhauls of the Water Tank it will be necessary to re-calibrate the Graduated Scale, Scale Carrier, Pointer and Float Assembly to ensure the Tank delivers the amount of water pre-set on the Graduated Scale.

A large set of platform scales with a minimum reading of around 200lbs and a water collection tank of around 25 gallons capacity will be required to calibrate the Tank and the following procedures should be carried out.

1) Connect a suitable water supply to the Water Inlet, it will be more convenient for the purposes of the test if a shut off tap is located adjacent to the Tank.

2) Check that the ends of the Graduated Scale align with the outer edge of the Scale Carrier, loosen the wing nut and make sure the Pointer and Float Arm move freely.

3) Checking the Discharge Valve is closed, turn on the water supply allowing water to enter the Tank through the Inlet Valve until the water is level with the top of the baffle within the Tank. The height of the baffle equates to a water level of five gallons. Turn off the water supply. Allow the Pointer/Float to stabilise and check the reading on the Graduated Scale. Depending on the distance the Pointer is from the 5 gallon mark on the Scale either, move the Scale along the Scale Carrier to align with the Pointer, shorten the Float Arm by screwing further through the Pointer Pivot Pin or slightly bend the Float Arm so the Pointer and Graduated Scale are correctly aligned on the 5 gallon mark. Open the Discharge Valve and drain the Tank. Close the Discharge Valve resetting the Tank.

4) Place the collection tank on the platform scales and position below the Water Discharge pipe. Zero the platform scales.

5) Set the Pointer to the 5 gallon mark on the Graduated Scale and tighten the wing nut. Turn on the water supply and proceed to fill the Tank through the Inlet Valve. When the Float trips the Lever shutting off the flow of water into the Tank, turn of the water supply, open the Discharge Valve discharging the water into the collection tank.

   Check the weight registered by the platform scales, as a gallon of water weighs 10lbs the platform scales should read 50lbs.

   If the reading is lower than 50lbs bend the Float Arm slightly, raising the Float, thereby allowing more water to enter the Tank before the Float trips the Inlet Valve.

   If higher than 50lbs bend the Float Arm to lower the float and re-test from “5”.

6) When the 5 gallon/50lbs test is successfully completed, set the Pointer to 15 gallons and re-test, a reading of 150lbs should be achieved on the platform scales.

7) Drain the Tank, refit to the mixer.

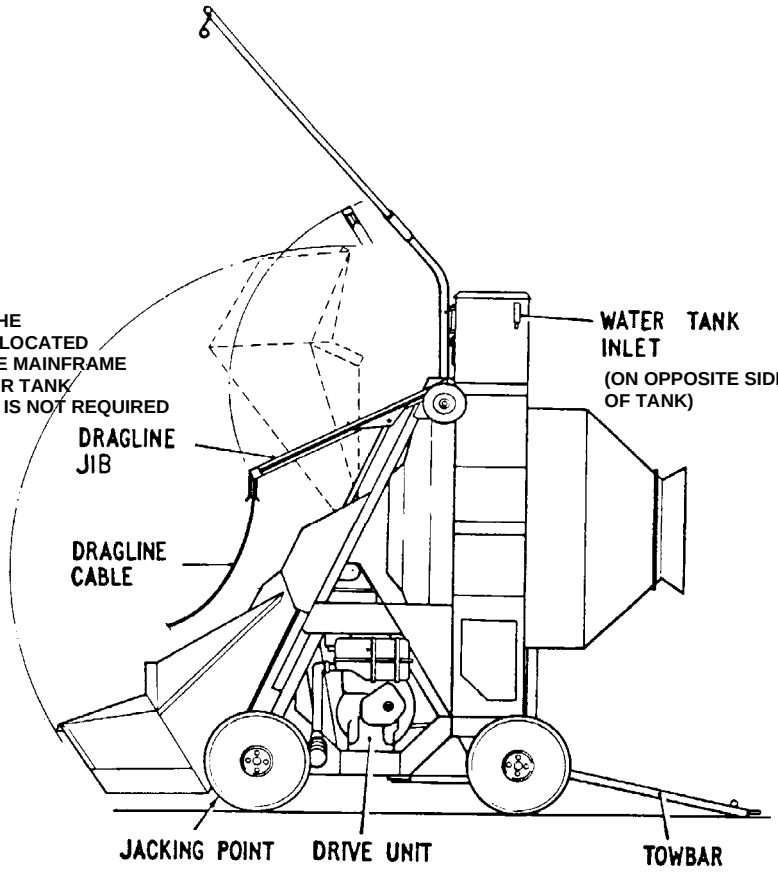
WORKSHOP MANUAL

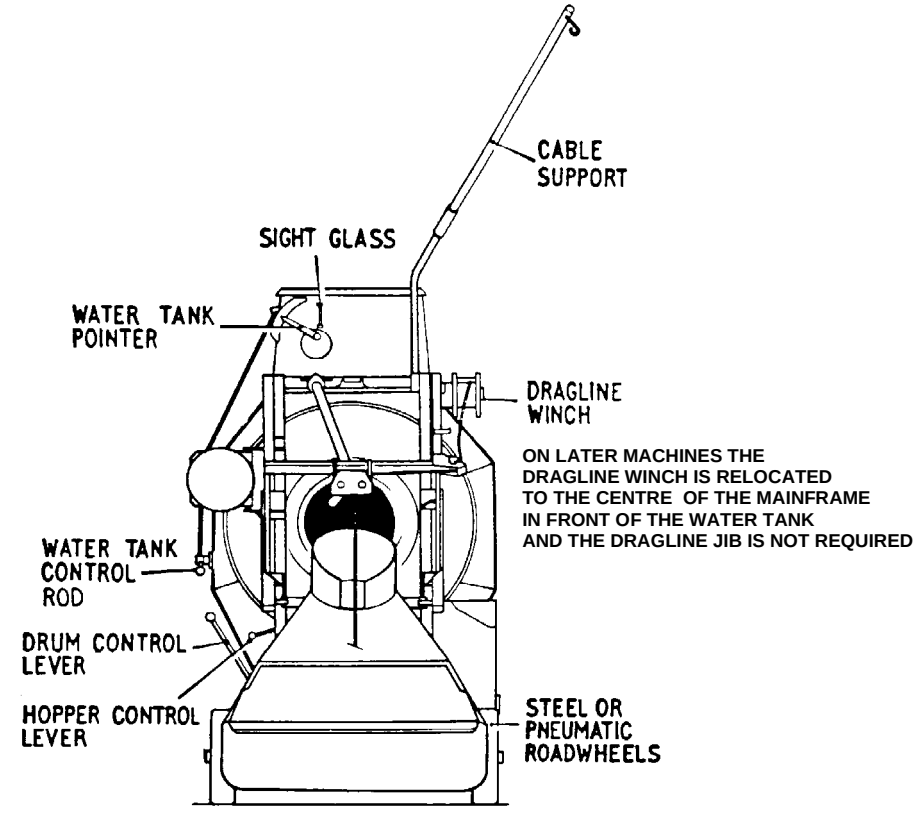
300R & 400R

SECTION 3

GENERAL ARRANGEMENT DIMENSIONS

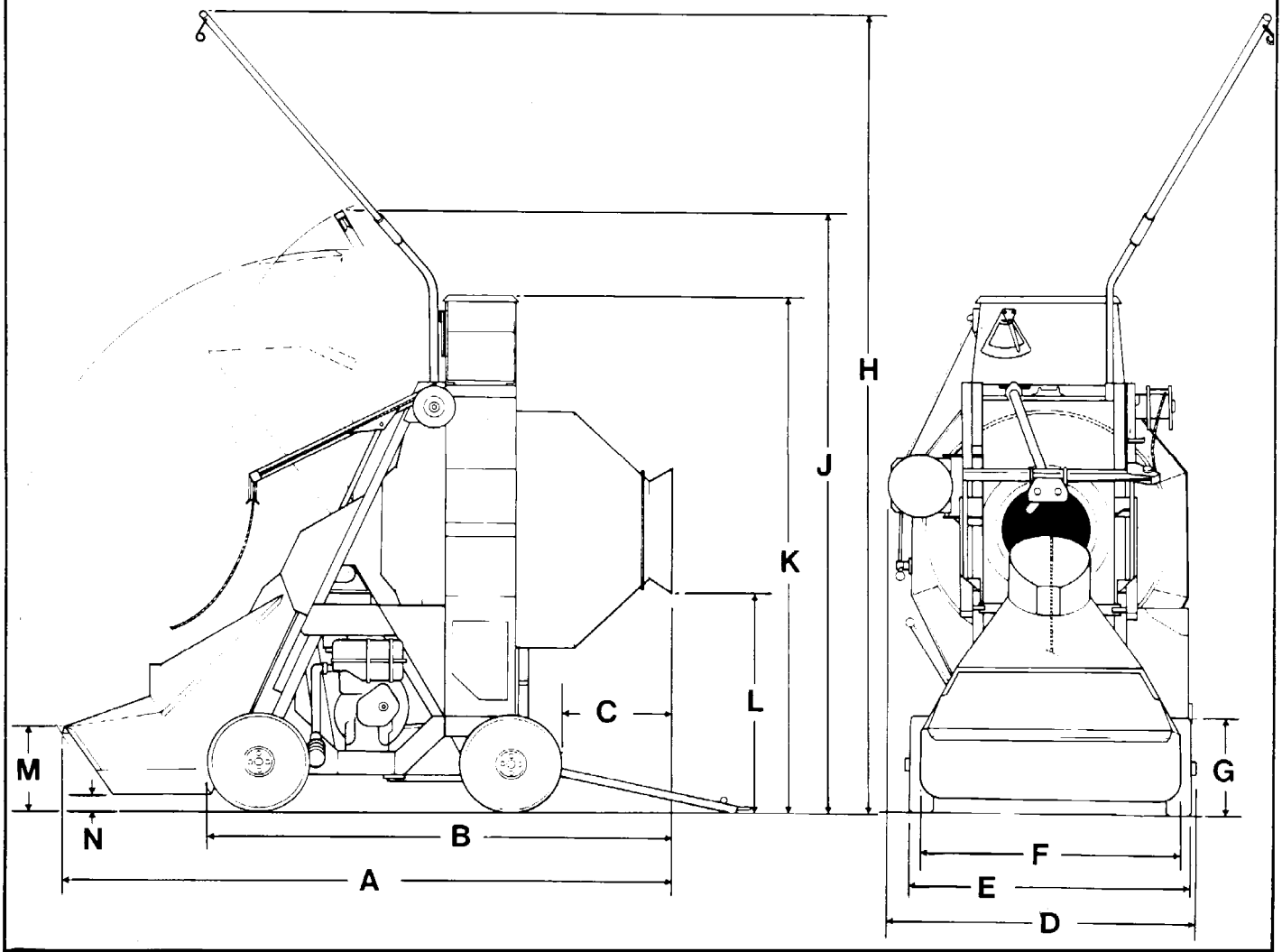
GENERAL ARRANGEMENT





DIMENSIONS

	300R		400R		500R	
A	3.33m	10'11"	3.71m	12'2"	4.14m	13'7"
B	2.50m	8'3"	2.81m	9'3"	3.05m	10'0"
C	36cm	14"	66cm	2'2"	66cm	2'2"
D	1.80m	5'11"	1.80m	5'11"	1.80m	5'11"
E	1.65m	5'5"	1.65m	5'5"	1.65m	5'5"
F	1.52m	5'0"	1.52m	5'0"	1.52m	5'0"
G	61cm	2'0"	61cm	2'0"	61cm	2'0"
H	4.88m	16'0"	4.88m	16'0"	4.88m	16'0"
J	3.77m	12'5"	3.77m	12'5"	3.96m	13'0"
K	3.14m	10'3"	3.14m	10'3"	3.23m	10'7"
L	1.37m	4'6"	1.37m	4'6"	1.37m	4'6"
M	52cm	1'8"	52cm	1'8"	52cm	1'8"
N	10cm	4"	10cm	4"	10cm	4"



ALL STATED DIMENSIONS ARE APPROXIMATE AND CANNOT BE GUARANTEED DUE TO OUR POLICY OF CONTINUOUS PRODUCT IMPROVEMENTS AND IMPROVEMENTS IN SPECIFICATION

WORKSHOP MANUAL

300R & 400R

SECTION 4

SERVICE SCHEDULES
LUBRICATION DIAGRAM

WORKSHOP MANUAL

300R 400R

WINGET REVERSING DRUM CONCRETE MIXERS

ISSUE 8 2012

Service Schedule

The engine will require additional services or adjustments in addition to those listed below. (See the appropriate Engine Operators Handbook or Workshop Manual)

Daily: (8) Hours

Before Work

Lubricate all grease points.

Check fuel and lubricating oil levels.

Check for oil and fuel leaks.

Check/clean/replace air filter element, cup and baffle.

After Work

Top up fuel tank.

Clean out drum and hopper

Wash down the mixer

Drain the water tank or flow meter.

Weekly: (40 Hours)

The above and the following:

Dragline Wire Rope	Check for wear or damage
Drive Chain	Check tension, adjust if necessary
Drive Chain Case	Check oil level, top up if necessary.

Hydraulic Oil	Check level in main and header tanks. (with hopper down and engine stopped)
Dynamo/Alternator Drive	Check belt tension, adjust if necessary
Controls and Pivots	Lubricate all levers, rods, pivots and pins with oil
Battery	Check terminals, clean if necessary, top up

Monthly: (100 Hours)

The above and the following:

Hydraulic Tank	Check oil tank, filler and breather, clean if necessary.
Drum Drive	Inspect and lubricate the faces and teeth of the drum track ring, gear idler rollers and edge rollers using open gear lubricant.

Every 3 Months: (300 Hours)

The above and the following:

Engine	Change air filter element
	Change lubrication oil and filter
	Change fuel filter

(Also see relevant Engine Handbook/Workshop Manual)

Every 6 Months: (600 Hours)

The above and the following:

Gearbox	Drain and refill
Drive Chain Case	Drain and refill

Every 12 Months: (1200 Hours or earlier if conditions dictate)

The above and the following:

Hydraulics	Drain and clean out tank, suction strainer and filling filter, refill with clean hydraulic oil.

Grease and lubrication points

Every day: All shafts and bearings needing daily attention are lubricated through drilled shafts and special greaseways by fitting grease nipples.

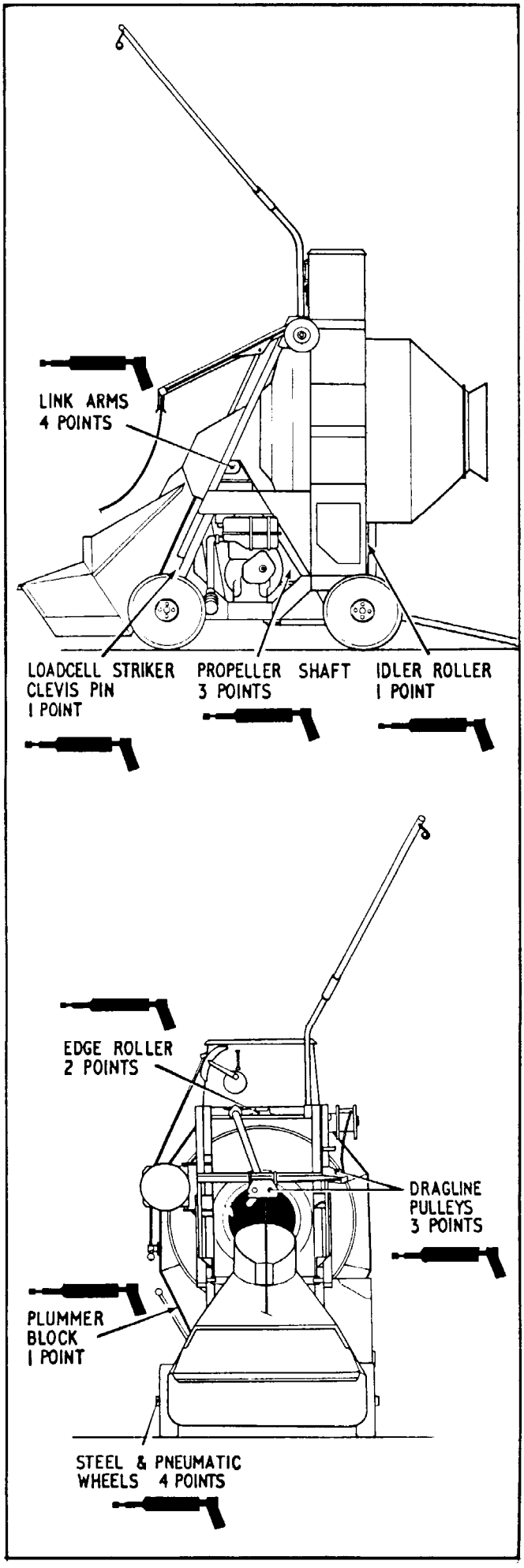
The lubrication diagram will give you the location of these grease nipples, which should be greased daily, using a grease gun charged with a good quality medium grease.

It is essential that operators do not allow grease or oil used for servicing to become contaminated with sand or cement dust.

Every week: A little engine oil should be applied to pin joints on clutch lever linkage, and low level dragline pivots, etc.

Note:- later mixers will not be fitted with all the Lubrication & Grease points shown as sealed for life roller bearings are used extensively where ever possible.

Lubricate drum drive gears and drum track and roller contact surfaces using open gear lubricant on a regular basis, in some operating conditions the gears and track should be lubricated every 40 hours or weekly.



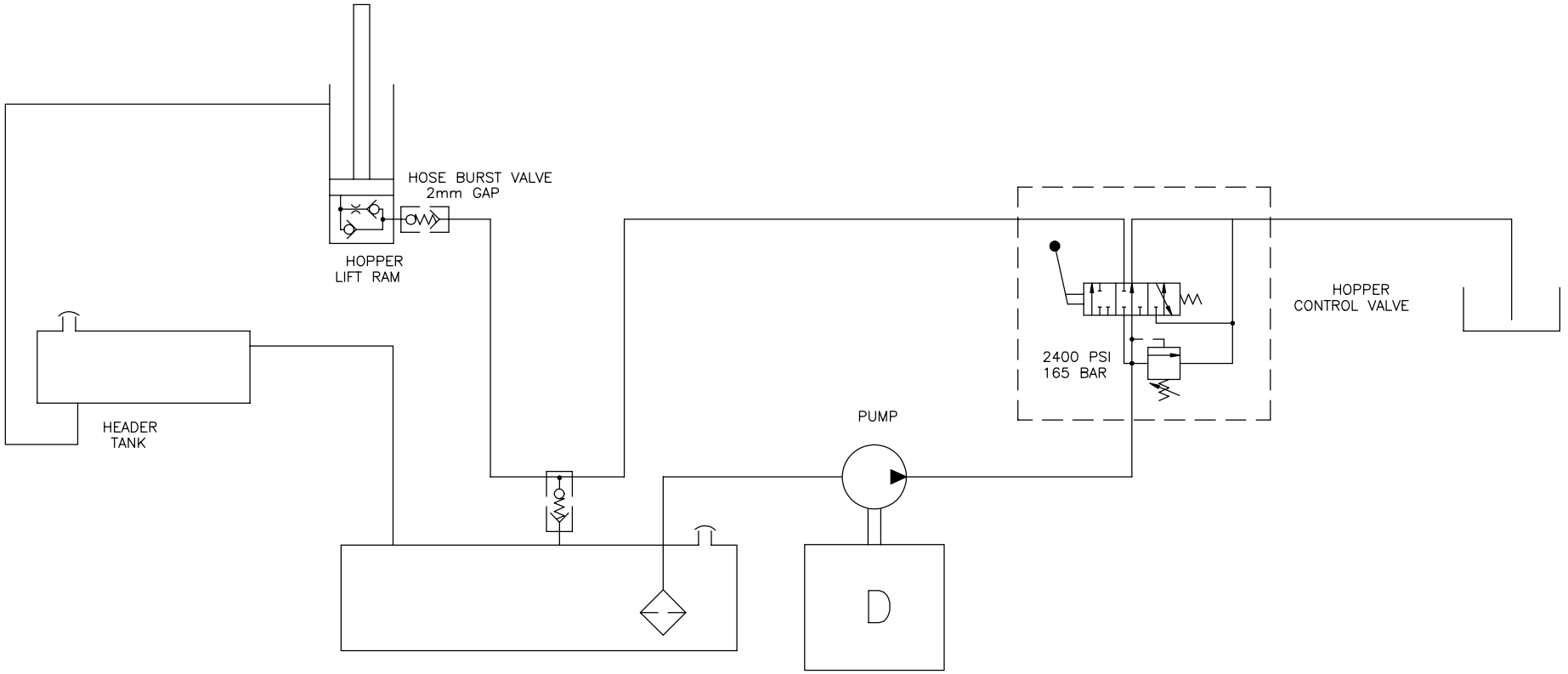
WORKSHOP MANUAL

300R & 400R

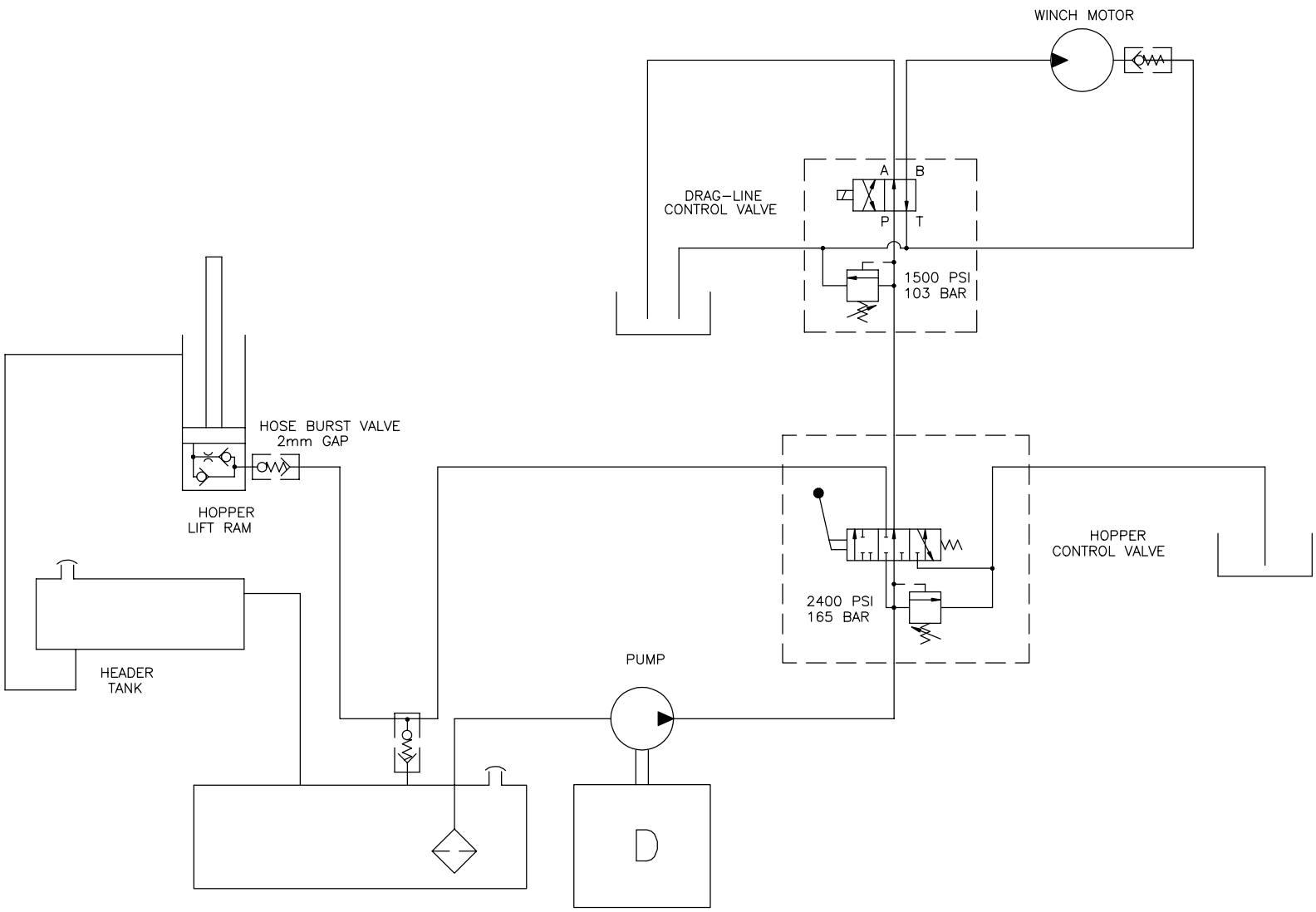
SECTION 5

HYDRAULIC CIRCUIT DIAGRAMS

Hyd circuit.dwg 04/03/02 12:56:51 Scaled to fit



Hyd. Circuit - RSeries Mixer (With dragline).dwg 04/03/02 12:58:17 Scaled to fit



WORKSHOP MANUAL

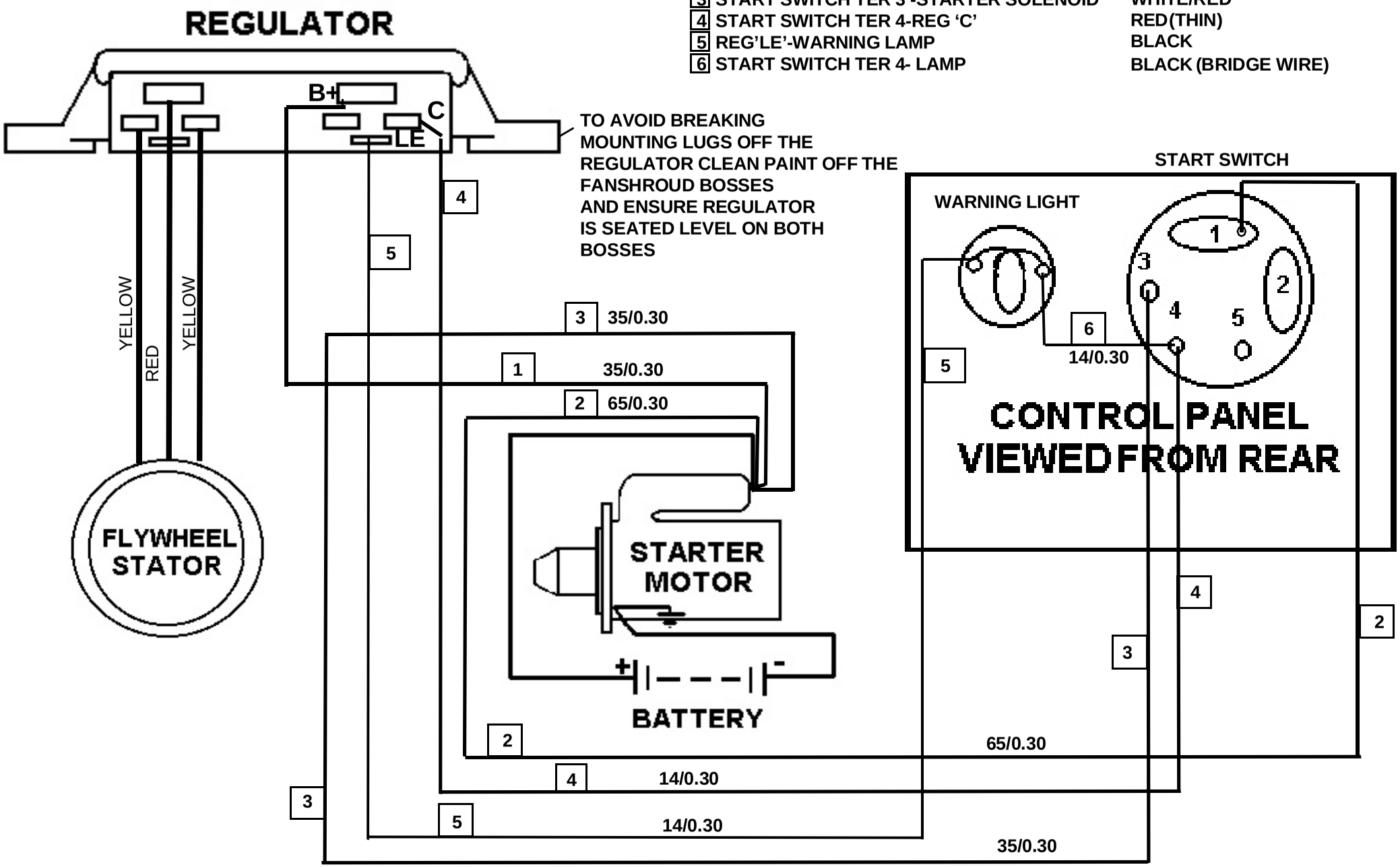
300R & 400R

SECTION 6
WIRING DIAGRAMS

LISTER-PETTER 'NISCA' CHARGING SYSTEM WIRING DIAGRAM

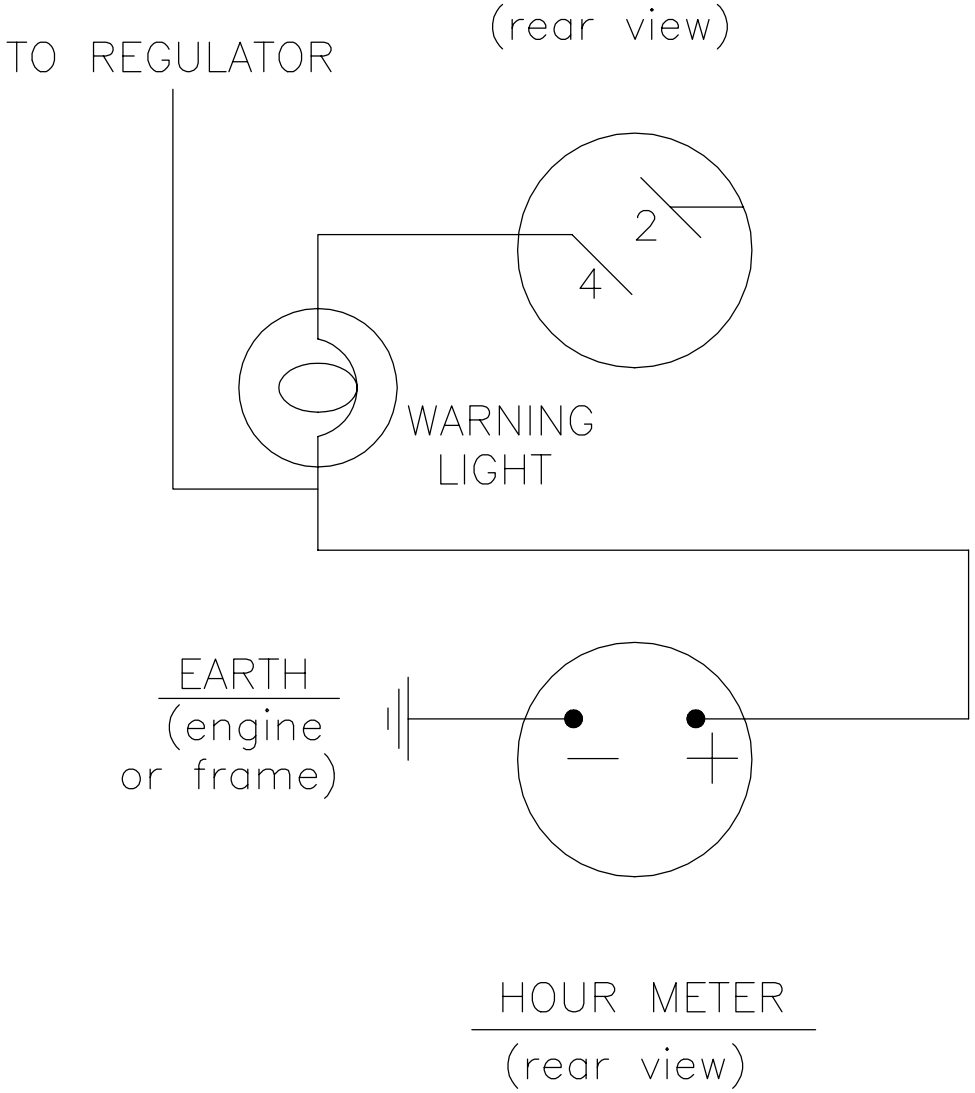
WIRING COLOUR CODES

1	STARTER MOTOR-REG'B'	RED (THICK)
2	START SWITCH TER 1-STARTER MOTOR	BROWN
3	START SWITCH TER 3 -STARTER SOLENOID	WHITE/RED
4	START SWITCH TER 4-REG 'C'	RED(THIN)
5	REG'LE'-WARNING LAMP	BLACK
6	START SWITCH TER 4- LAMP	BLACK (BRIDGE WIRE)



Hourmeter & lamp.dwg 04/03/02 12:50:36 Scaled to fit

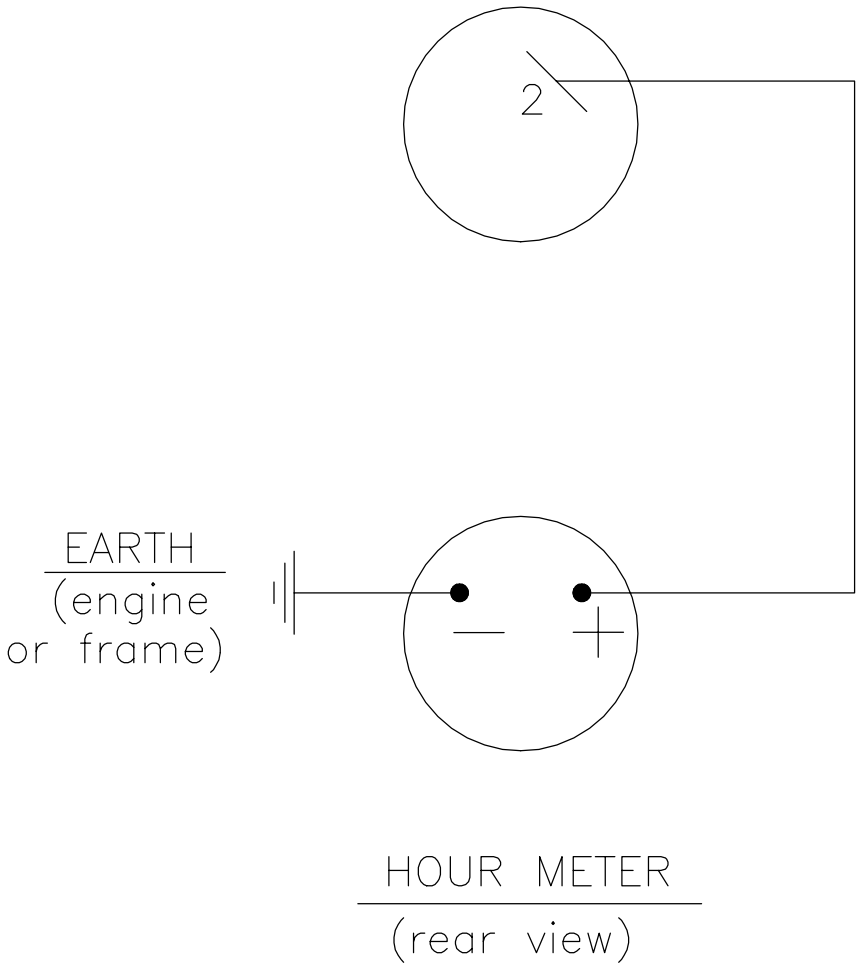
HOUR METER WIRING
WITH WARNING LIGHT



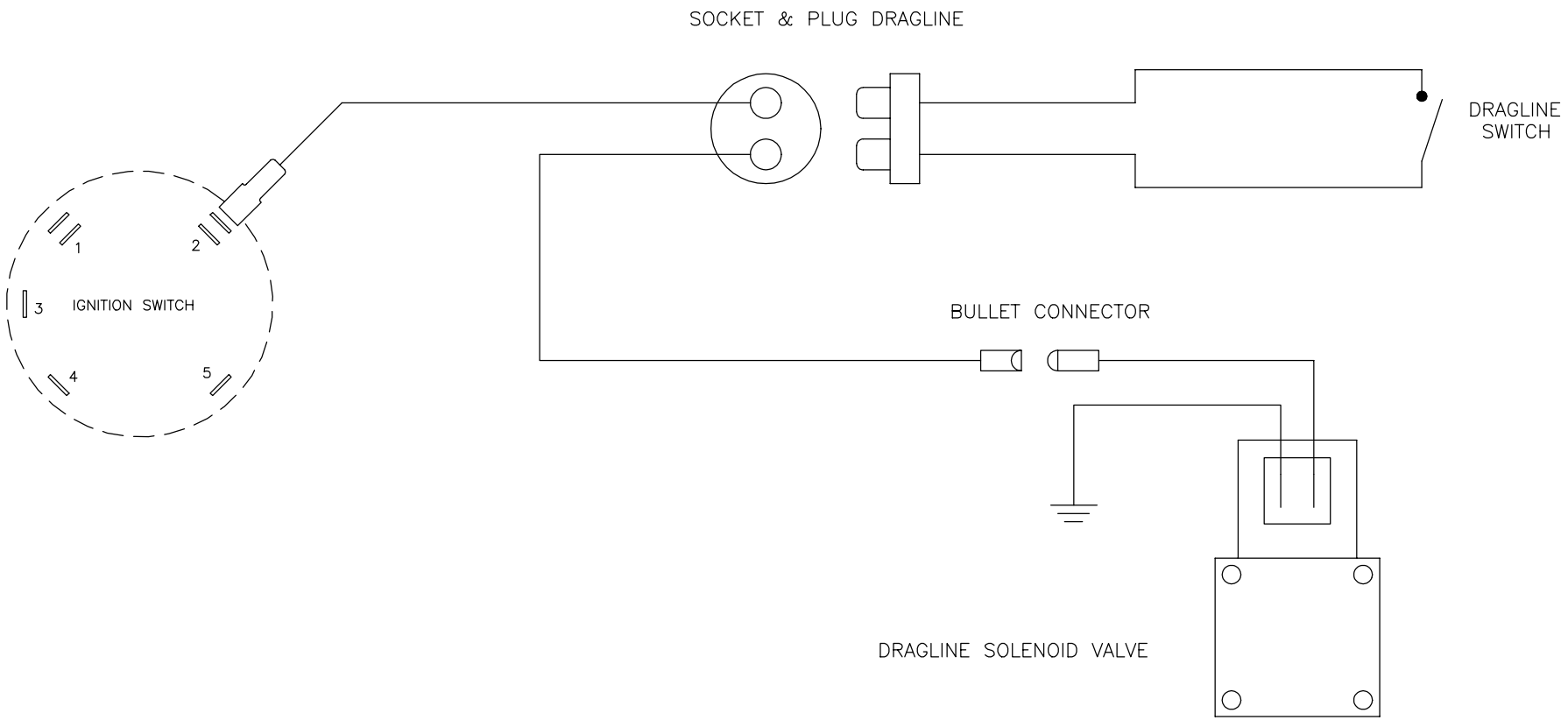
Hourmeter no lamp.dwg 04/03/02 12:53:33 Scaled to fit

HOUR METER WIRING

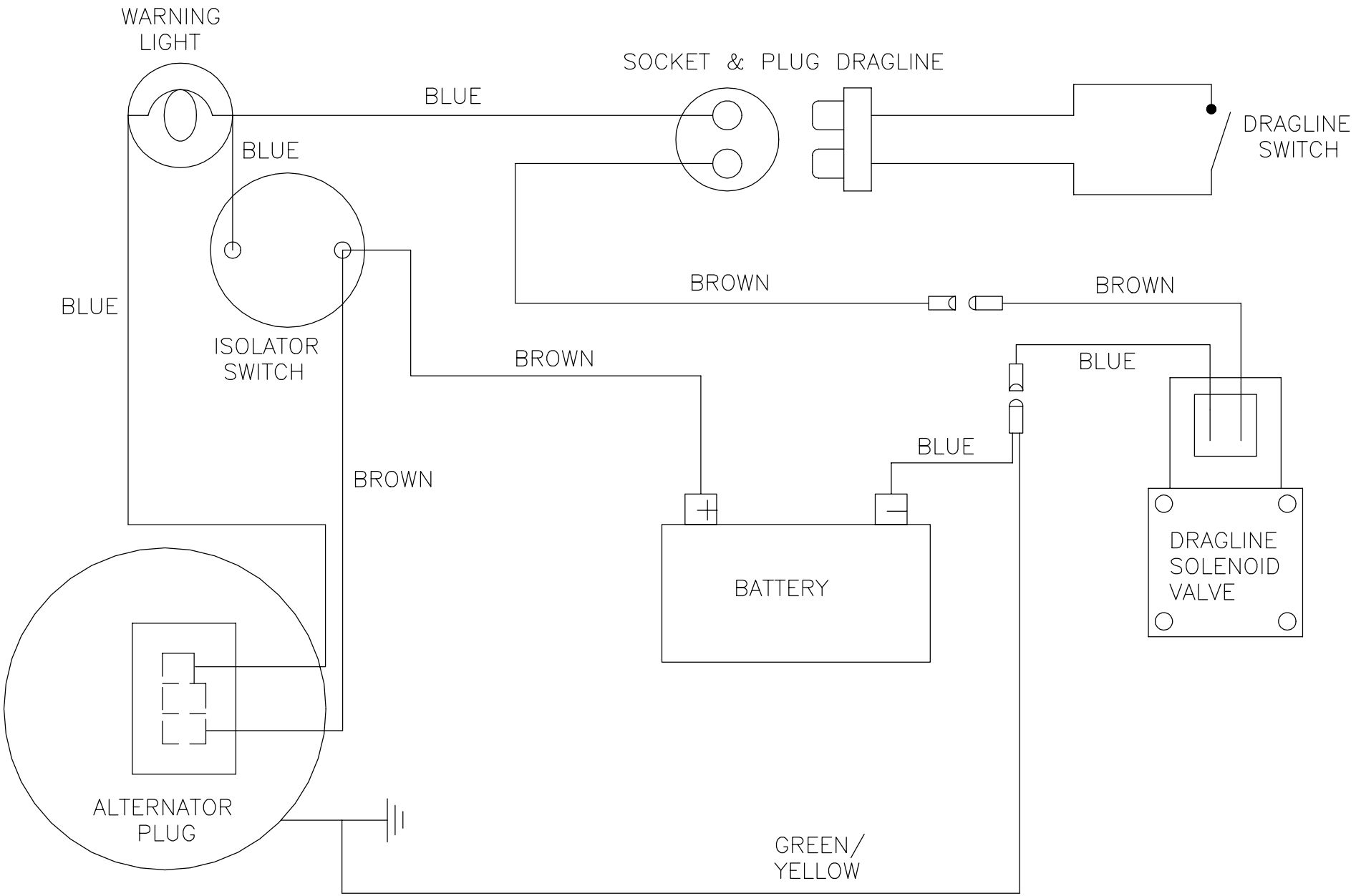
NO WARNING LIGHT



loom.dwg 04/03/02 12:59:24 Scaled to fit



Alternator.dwg 04/03/02 13:33:44 Scaled to fit



WORKSHOP MANUAL

300R & 400R

SECTION 7
NOISE LEVELS

SECTION 7

NOISE LEVELS

Noise Tests were carried out in accordance with EC Directive 79/113 on a 10 metre Hemisphere with the drum empty and rotating and in accordance with EC Directive 2000/14/EC again on a 10 metre hemisphere with the drum loaded and rotating.

Operators Ear Tests were carried out at a distance 1 metre from the Drum and Hydraulic Control Levers at a height of 1 metre.

Lister Petter TS2-08 Standard Build (79/113)

10 metre	111Lwa
Operators Ear	98Lpa

Lister Petter TS2-08 Standard Build (2000/14/EC)

10 metre	115Lwa
Operators Ear	98Lpa

Lister Petter TS2-63 Low Noise Build with cladding kit fitted to mainframe and engine (79/113)

10 metre	109Lwa
Operators Ear	97Lpa

415 Volt Electric Motor (79/113)

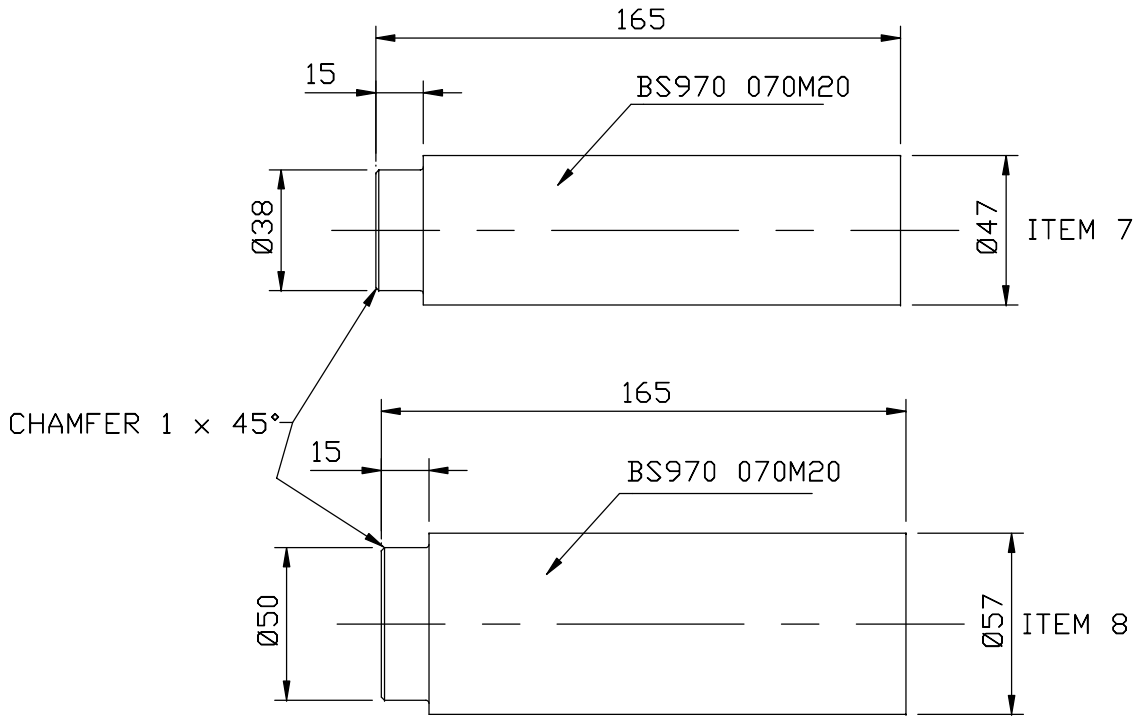
10 metre	109Lwa

WORKSHOP MANUAL

300R & 400R

SECTION 8
SPECIAL TOOLS

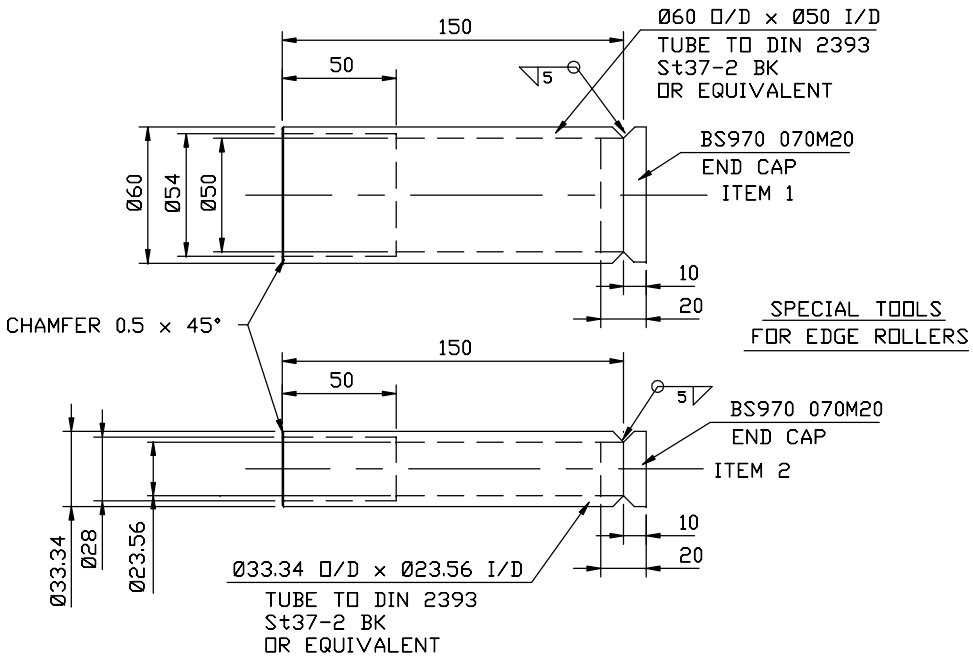
TOOL1.dwg 04/03/02 13:02:23 Scaled to fit



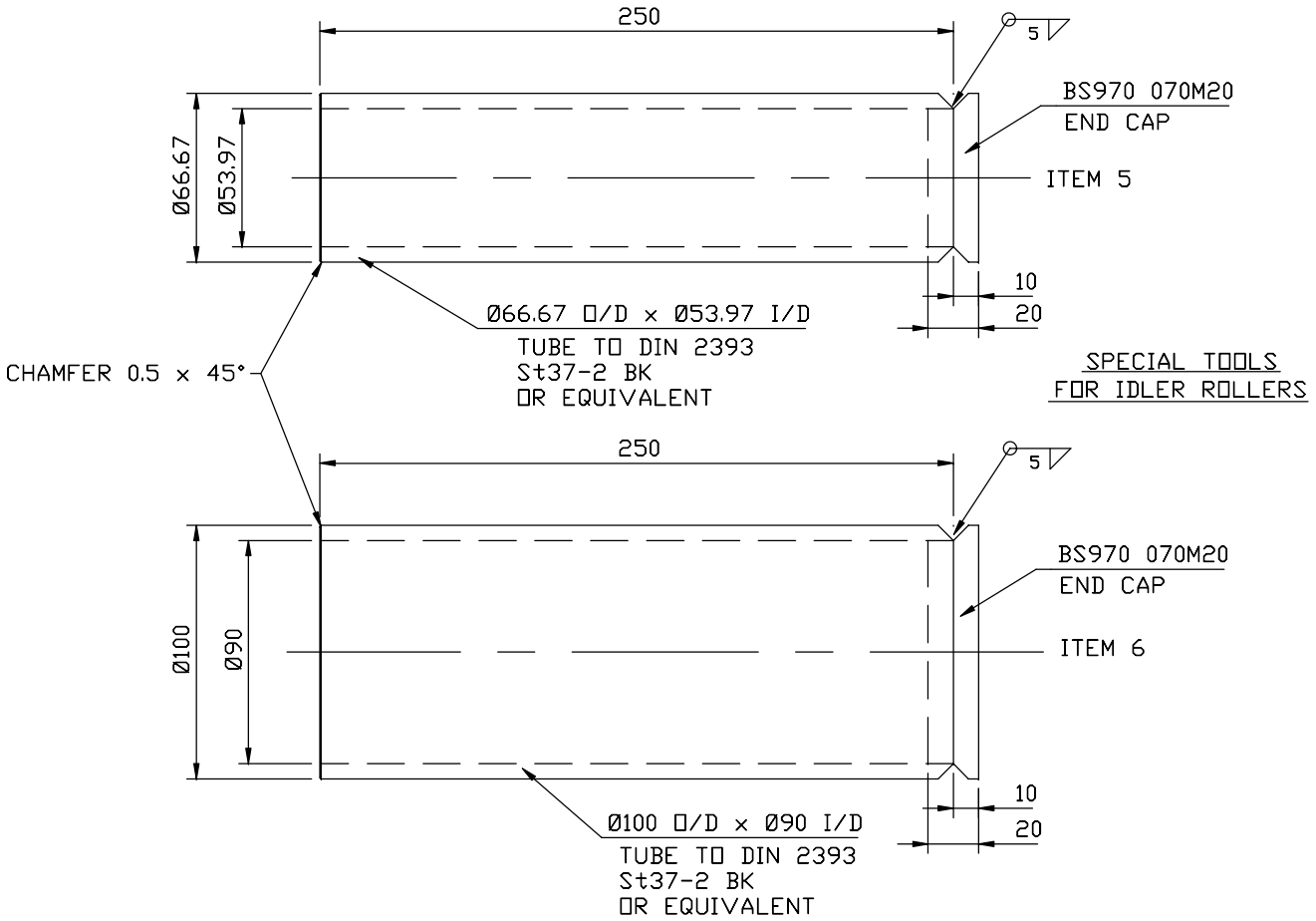
SPECIAL TOOL
FOR BATCHWEIGHER
STRIKER GUIDE ROLLER

SPECIAL TOOL
FOR HOPPER
CRADLE PIVOT

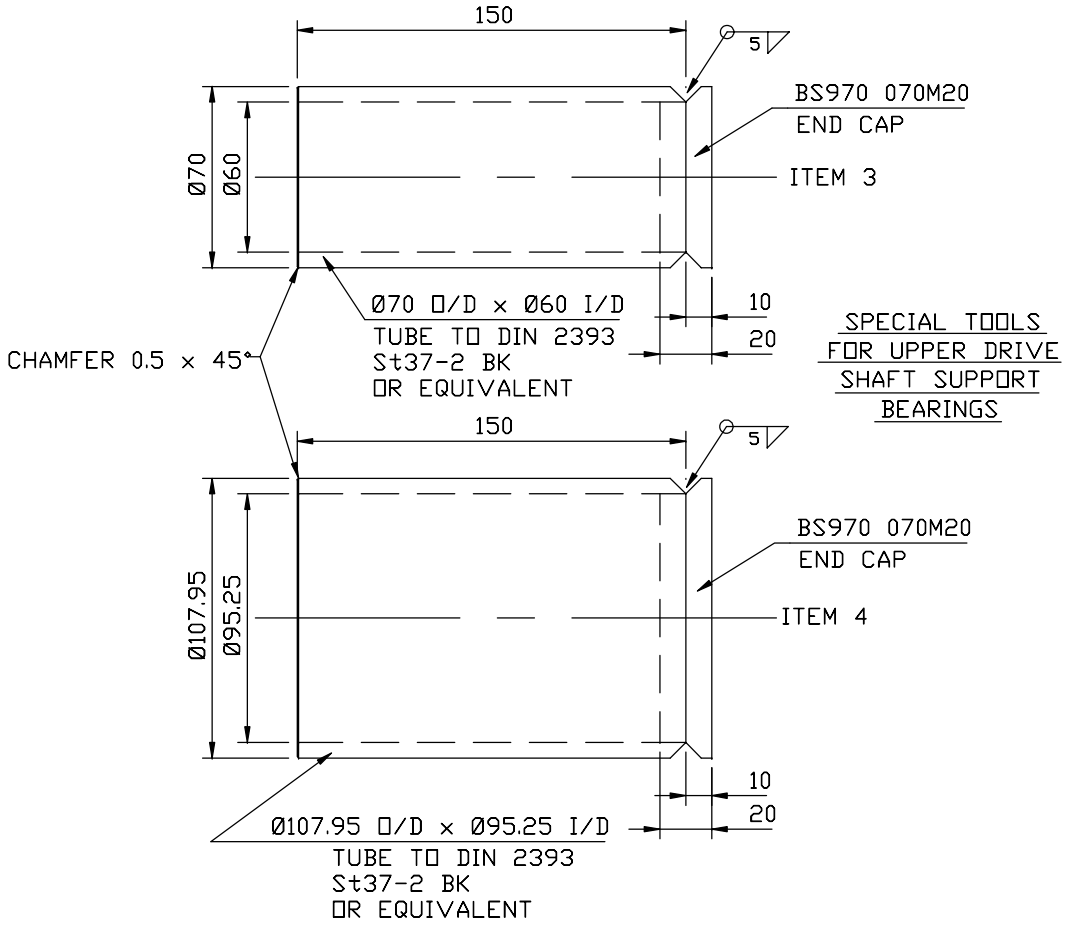
TOOLS3.dwg 04/03/02 13:06:20 Scaled to fit



TOOLS2.dwg 04/03/02 13:07:58 Scaled to fit



TOOL.dwg 04/03/02 13:01:18 Scaled to fit



WORKSHOP MANUAL

300R & 400R

SECTION 9

HYDRAULIC CONTROL VALVE SERVICE MANUAL

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WORKSHOP MANUAL

300R & 400R

SECTION 10

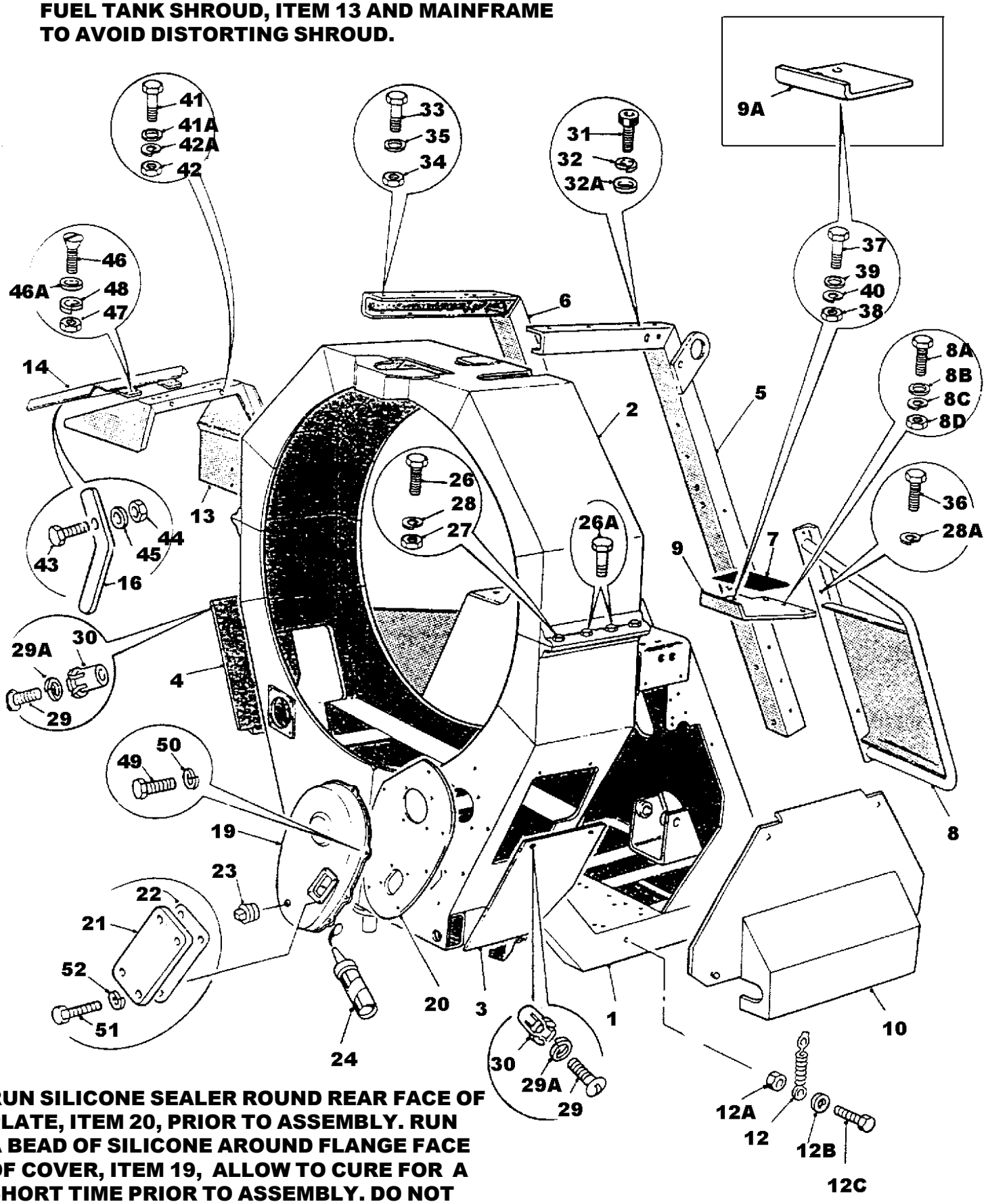
PARTS LISTINGS

The following Parts Illustrations do not contain a breakdown of assemblies such as Gearbox, Drum, Hydraulic Ram etc, only the complete items are shown.

For a breakdown of these items please refer to the Operators and Parts Manual

400R MAINFRAME, TANK SUPPORTS AND COVERS

FIT SPACING WASHERS V2004220 BETWEEN FUEL TANK SHROUD, ITEM 13 AND MAINFRAME TO AVOID DISTORTING SHROUD.



RUN SILICONE SEALER ROUND REAR FACE OF PLATE, ITEM 20, PRIOR TO ASSEMBLY. RUN A BEAD OF SILICONE AROUND FLANGE FACE OF COVER, ITEM 19, ALLOW TO CURE FOR A SHORT TIME PRIOR TO ASSEMBLY. DO NOT FILL CHAIN CASE WITH OIL UNTIL SEALER HAS FULLY CURED.

400R MAINFRAME TANK SUPPORTS + COVERS

1	555272300	MAINFRAME	1
2	555130600	DRUM GUARD	1
3	555264802	GUARD PLATE LH	1
4	555264801	GUARD PLATE RH	1
5	555145700	SUPPORT WATER TANK LH	1
6	555145600	SUPPORT WATER TANK RH	1
7	V2003183	SAFETY WALK	1
8	555189900	GUARD/FENCE UK/EUROPE	1
9	555190400	STEP UK/EUROPE	1
9A	555163500	STEP - EXPORT	1
10	555131500	COVER - CONTROL SIDE	1
12	221101000	SPRING CATCH	1
12A	192S01	NUT BINX	1
12B	10S02	WASHER FLAT	1
12C	66S02A	SCREW SET	1
13	555193100	SHROUD - FUEL TANK	1
14	555193200	COVER - FUEL TANK	1
16	555193400	LATCH	1
19	555263900	COVER - CHAIN CASE	1
20	555257800	PLATE - CHAIN CASE	1
21	555114700	COVER - CHAIN INSPECTION	1
22	555168100	GASKET - COVER	1
23	127S03	PLUG BLANK 3/8 BSP	1
23A	100S03	SEAL BONDED 3/8 (NOT ILLUSTRATED)	1
24	V2000772	SILICONE SEALER	1
26	28S03E	SCREW SET	6
26A	6S03B	BOLT (WATER TANK OPERATING ROD BRACKET)	2
27	87S03	NUT BINX	8
28	10S03	WASHER FLAT	8
28A	17S05	WASHER SPRING	4
29	16S07C	SCREW SLT PAN HEAD	4
29A	17S03	WASHER SPRING	4
30	236S04	NUT BLIND NYLON	4
31	90S06H	SCREW SKT CAP	6
32	41S07	WASHER SPRING	6
32A	10S04	WASHER FLAT	6
33	6S05Z	SCREW SET (WATER TANK)	4
34	87S05	NUT	4
35	10S04	WASHER FLAT	4
36	11S04C	SCREW SET	4
37	28S05G	SCREW SET	2
38	9S04	NUT	2
39	10S04	WASHER FLAT	2
40	41S07	WASHER SPRING	2
41	28S03E	SCREW SET	3
41A	10S03	WASHER FLAT	3
42	9S03	NUT	3
42A	41S05	WASHER SPRING	3
43	66S01CC	SCREW SET	1

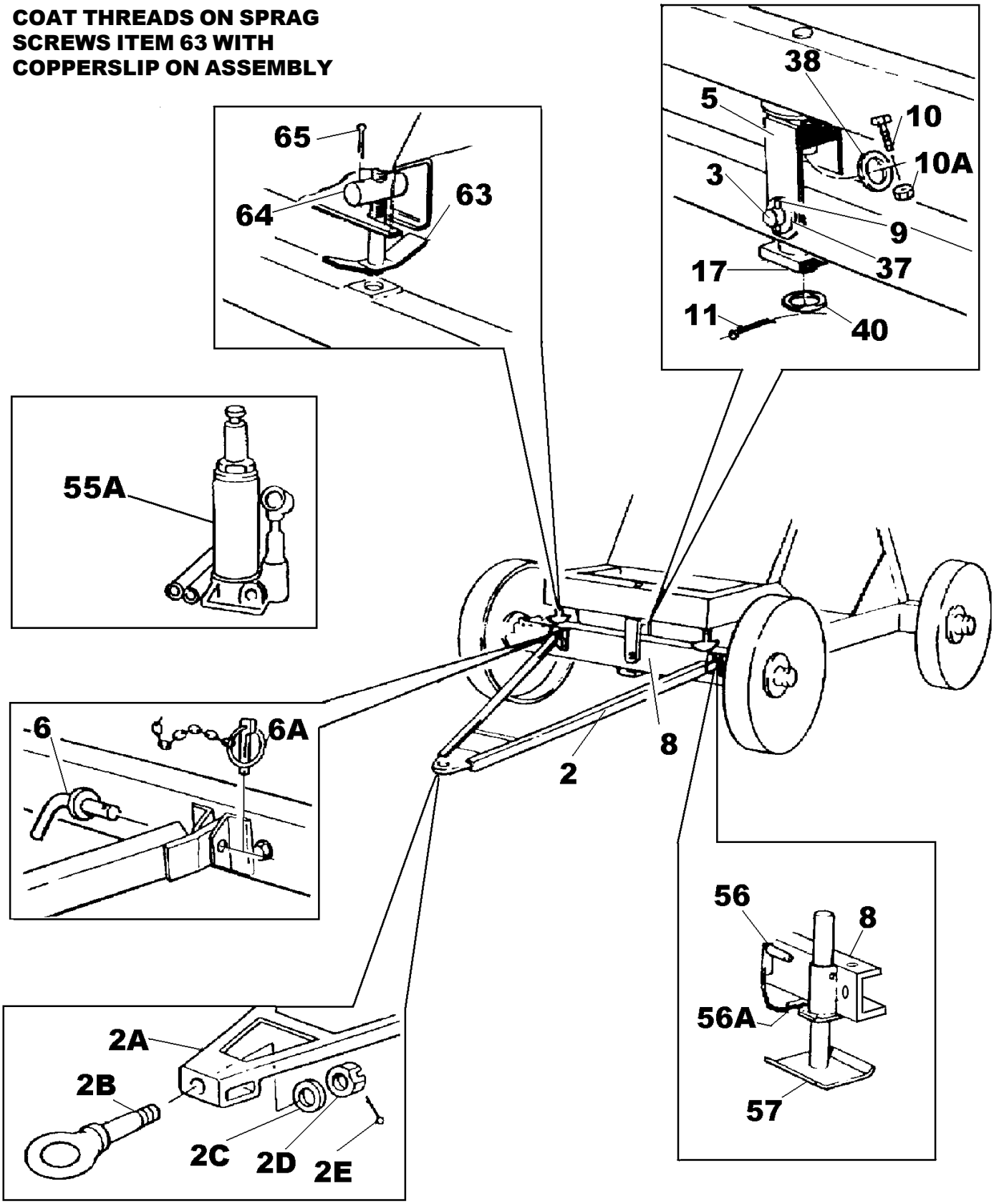
400R MAINFRAME TANK SUPPORTS + COVERS

44	192S01	NUT BINX	1
45	10S01	WASHER FLAT	1
46	233S03F	SCREW COUNTER SUNK	6
46A	267S03	WASHER FLAT	6
47	7S01	NUT	6
48	17S02	WASHER SPRING	6
49	11S03B	SCREW SET	7
50	17S04	WASHER SPRING	7
51	66S01BB	SCREW SET	4
52	41S03	WASHER SPRING	4

400R FRONT AXLE, TOWBARS, AXLE SPRAGS AND JACKS

COAT PINS AND WELDED BOSSES WITH COPPERSLIP ON ASSEMBLY

COAT THREADS ON SPRAG SCREWS ITEM 63 WITH COPPERSLIP ON ASSEMBLY



ITEM 2B, NATO TOWING EYE SHOULD BE CROSS DRILLED ON ASSEMBLY TO ENABLE FITMENT OF SPLIT PIN ITEM 2E

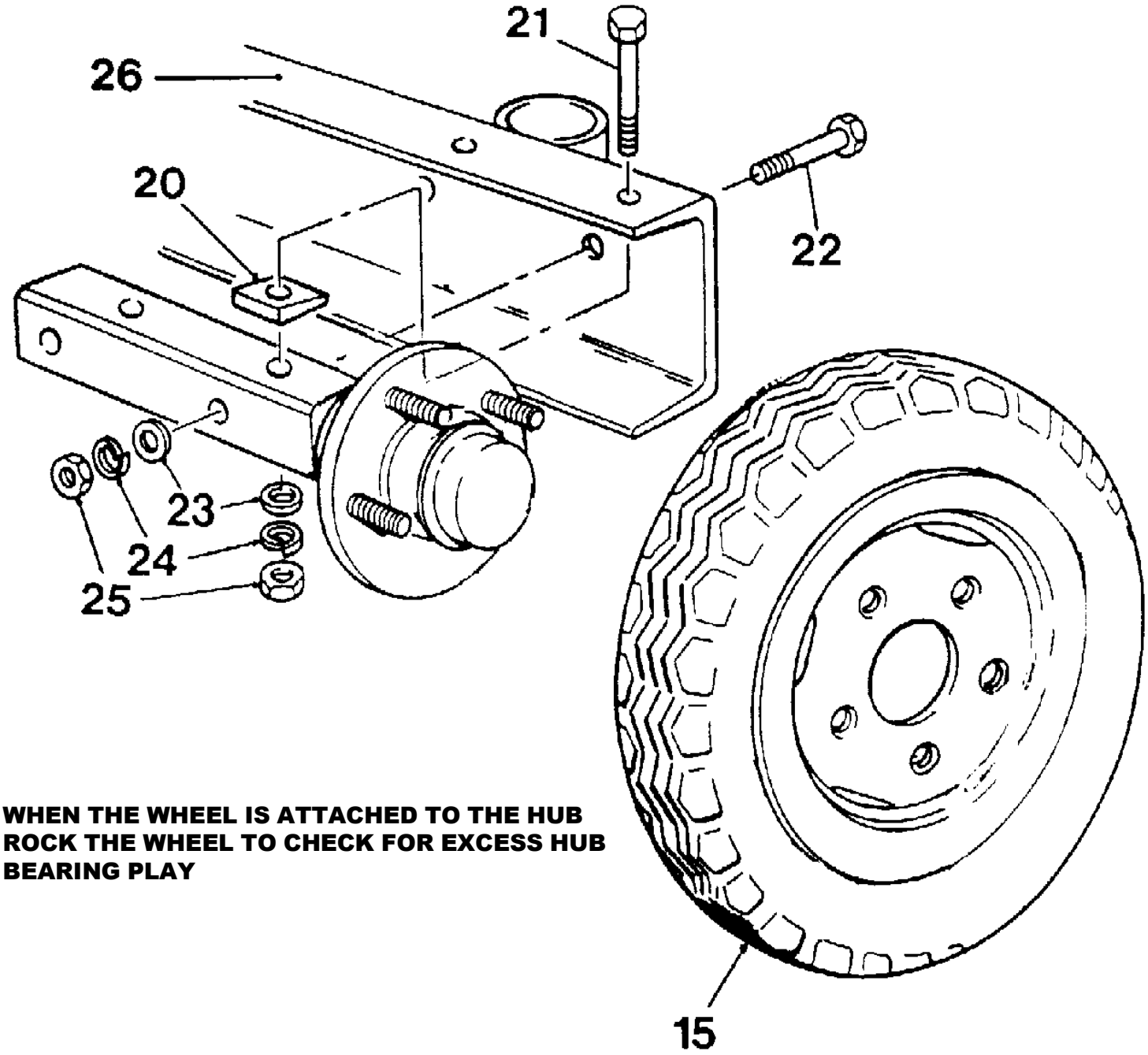
400R FRONT AXLE TOWBARS AXLE SPRAGS & JACKS

2	555101200	BAR TOW-STANDARD	1
2A	555283300	BAR TOW-NATO/MOD	1
2B	555283600	EYE TOWING-NATO/MOD	1
2C	150S15	WASHER FLAT	1
2D	92S15	NUT CASTLE	1
2E	44S18N	PIN SPLIT	1
3	555101400	PIN PIVOT AXLE	1
5	555101900	PIVOT BRACKET	1
6	513354800	PIN RETAINING	2
6A	902S02	LYNCH PIN & CHAIN	2
8	555287300	AXLE FRONT-STANDARD/NATO	1
9	44S17K	PIN SPLIT	2
10	8S03E	BOLT	1
10A	61S03	NUT BINX	1
11	44S17K	PIN SPLIT	2
17	555255700	TIE BAR AXLE	1
37	10S20	WASHER FLAT	2
38	10S43	WASHER FLAT	1
40	10S65	WASHER FLAT	2
55A	555285600	JACK HYDRAULIC	1
56	555267800	PIN LOCKING	4
56A	124108001	BUCKLE	4
57	555190500	SUPPORT FOOT	4
63	555256200	SCREW AXLE SPRAG	2
64	555255900	PIN AXLE SPRAG	2
65	44S05H	PIN SPLIT	4

400R PNEUMATIC WHEELS, HUBS & STUB AXLES

IF THE AXLE CHANNEL SECTION IS PRODUCED FROM PARALLEL RATHER THAN TAPERED SECTION, SUBSTITUTE THE TAPERED WASHERS ITEM 20 FOR FLAT WASHERS 267S07

IF BOLT ITEM 22 FOULS JACK LEG SUPPORT BRACKET INSERT FROM OPPOSITE SIDE



WHEN THE WHEEL IS ATTACHED TO THE HUB ROCK THE WHEEL TO CHECK FOR EXCESS HUB BEARING PLAY

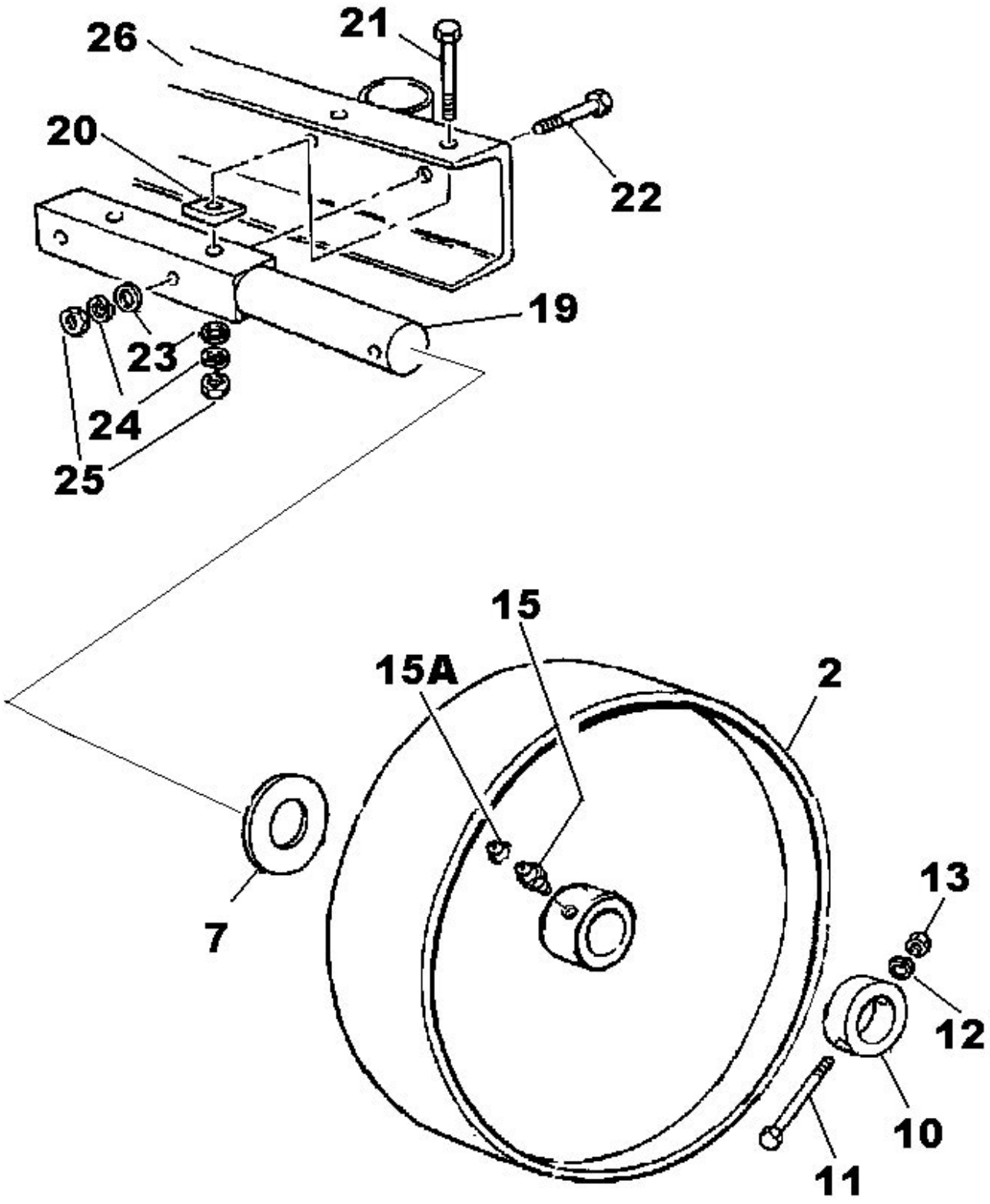
400R HUB STUB AXLE AND PNEUMATIC WHEELS

1	555287600	HUB & STUB AXLE ASSEMBLY (FAD)	4
15	475600019	WHEEL ASSEMBLY	4
20	105S05	WASHER TAPERED	8
21	8S05M	BOLT UPPER	8
22	8S05K	BOLT LOWER	8
23	267S07	WASHER FLAT	16
24	17S06	WASHER SPRING	16
25	7S05	NUT PLAIN	16
26	555226500	MAINFRAME	1
26A	555287300	AXLE FRONT-STANDARD/MOD/NATO	1

400R STEEL WHEELS AND STUB AXLE

IF THE AXLE CHANNEL SECTION IS PRODUCED FROM PARALLEL RATHER THAN TAPERED SECTION SUBSTITUTE THE TAPERED WASHERS ITEM 20 FOR FLAT WASHERS 267S07

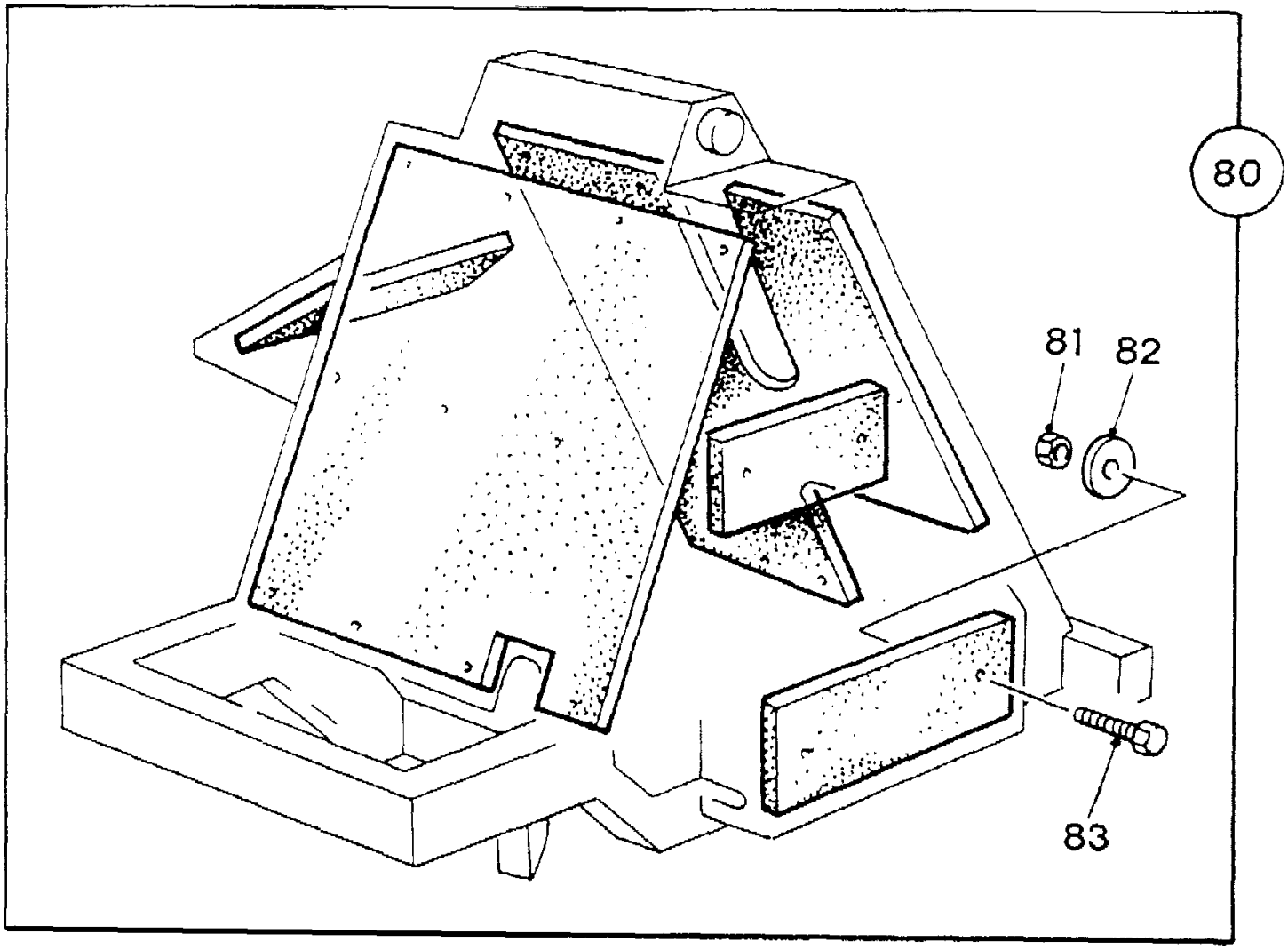
IF BOLT ITEM 22 FOULS JACK LEG SUPPORT BRACKET INSERT FROM OPPOSITE SIDE



400R HUB STUB AXLE AND STEEL WHEELS

2	511146701	WHEEL STEEL, FABRICATED	4
7	150S15	WASHER FLAT	4
10	555277900	COLLAR	4
11	6S03M	BOLT	4
12	41S05	WASHER SPRING	4
13	9S03	NUT	4
15	131S01	NIPPLE GREASE	4
15A	176S01	CAP NIPPLE	4
19	555288500	AXLE STUB	4
20	105S05	WASHER TAPERED (SEE NOTE RE 267S07)	8
21	8S05M	BOLT	8
22	8S05K	BOLT	8
23	267S07	WASHER FLAT	16
24	17S06	WASHER SPRING	16
25	7S05	NUT	16
26		CHASSIS-FRONT AXLE	1

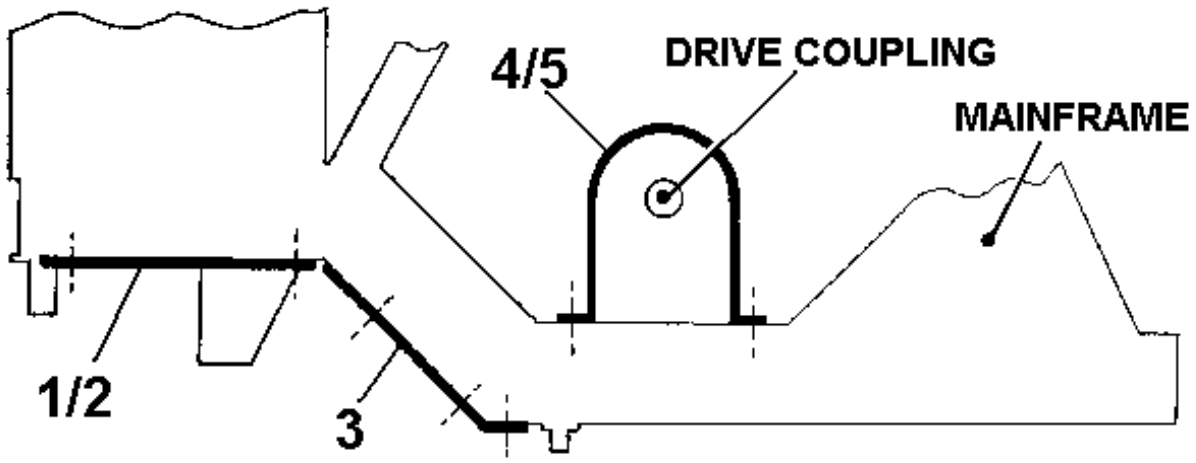
400R NOISE REDUCTION KIT

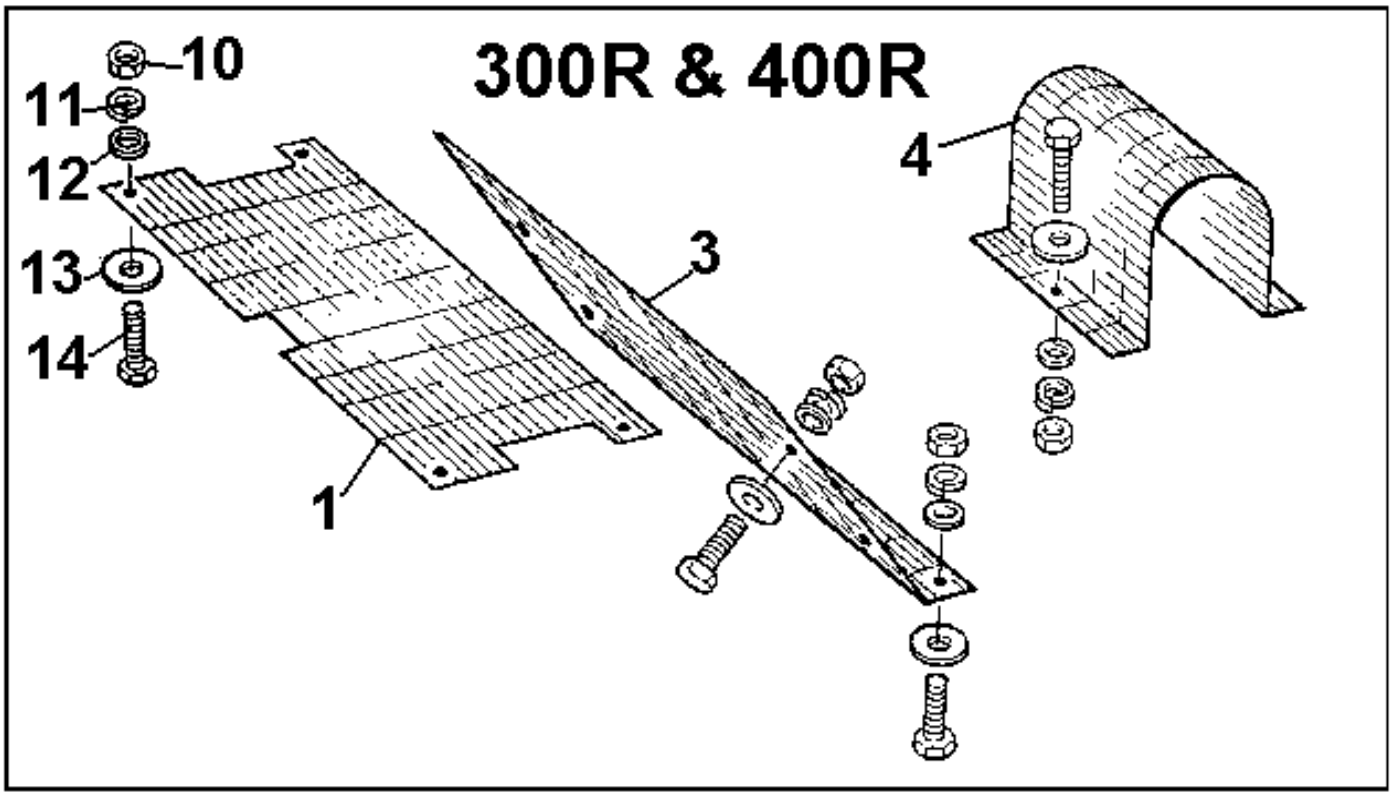


REFER TO THE ENGINEERING DRAWING WHEN DRILLING THE MAINFRAME AND PANELS TO SECURE THE CLADDING KIT.

400R NOISE REDUCTION KIT

80	555286500	KIT NOISE REDUCTION	1
81	61S02	NUT BINX	30
82	10S56	WASHER	30
83	11S02C	SCREW SET	30


4/5
DRIVE COUPLING
MAINFRAME
1/2
3


300R & 400R
10
11
12
13
14
1
3
4

400R 'CE' GUARDING

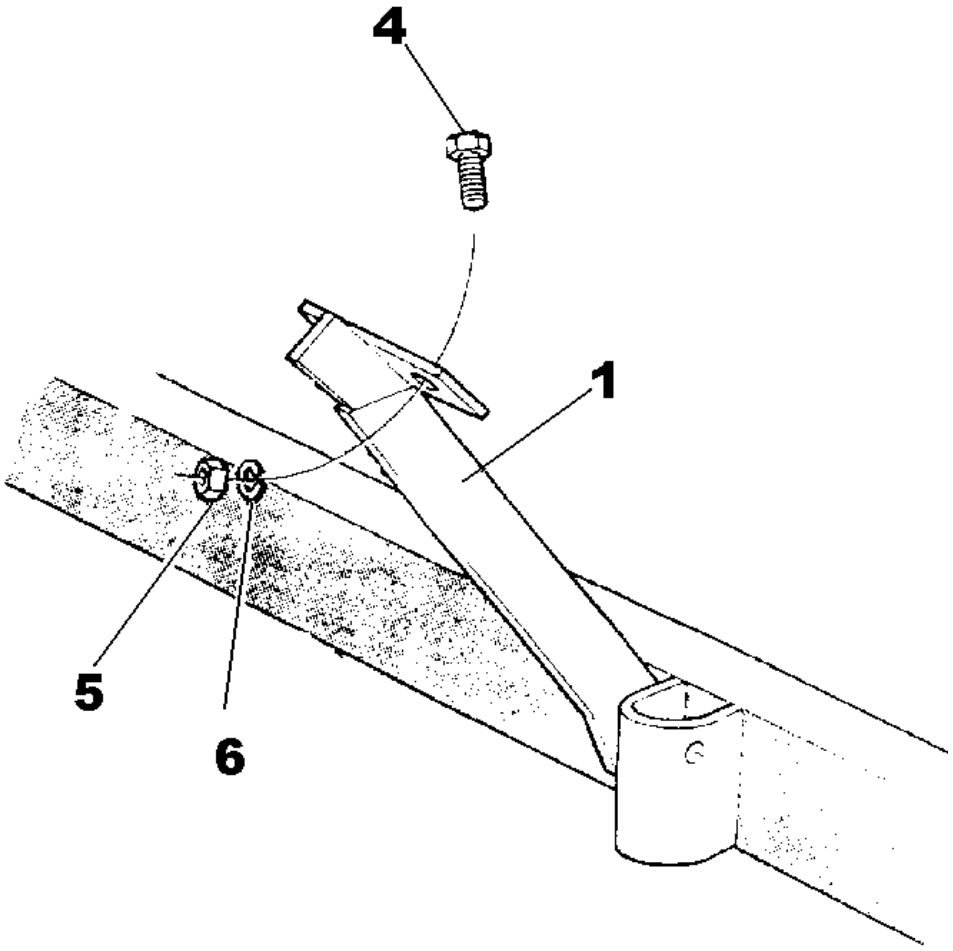
1	555290700	GUARD HORIZONTAL	1
3	555290800	GUARD ANGLED	1
4	555290900	GUARD ELECTRIC MOTOR-GEARBOX COUPLING	1
4	555291000	GUARD LISTER TS2-GEARBOX COUPLING	1
10	7S03	NUT	12
11	17S04	WASHER SPRING	12
12	267S05	WASHER FLAT	12
13	V2004220	WASHER SPECIAL	12
14	11S03C	SCREW SET	12

555131500 COVER RETAINED BY:-

11S03C	SCREW SET	2
267S05	WASHER FLAT	2
17S04	WASHER SPRING	2
7S03	NUT	2

400R HOPPER ANTI BOUNCE BRACKET

ATTACH ANTI BOUNCE BRACKET BETWEEN THE LEFT HAND SIDE OF THE HOPPER CRADLE AND MAINFRAME TO PREVENT DAMAGE TO COMPONENTS WHEN TRANSPORTING THE MACHINE



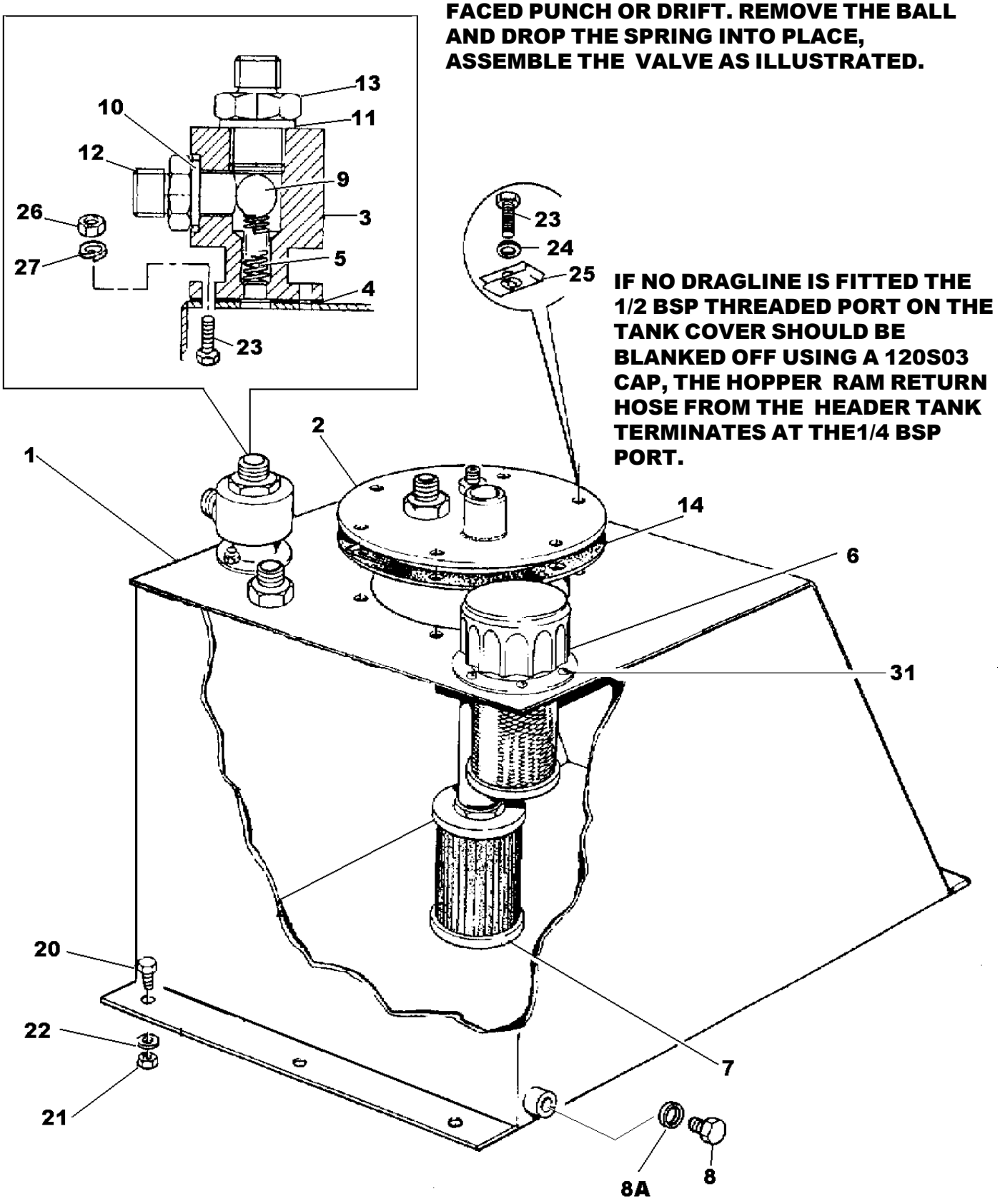
400R ANTI BOUNCE BRACKET

1	555288600	BRACKET ANTI BOUNCE	1
4	66S06D	SCREW SET	1
5	104S06	NUT	1
6	41S09	WASHER SPRING	1

400R HYDRAULIC TANK ASSEMBLY

THE BALL ITEM 9 SHOULD BE CORRECTLY SEATED WITHIN THE BLEED VALVE BODY ON ASSEMBLY, PLACE THE BALL INTO THE BODY WITHOUT THE SPRING THEN DRIVE THE BALL DOWN ONTO ITS SEAT USING A SOFT FACED PUNCH OR DRIFT. REMOVE THE BALL AND DROP THE SPRING INTO PLACE, ASSEMBLE THE VALVE AS ILLUSTRATED.

IF NO DRAGLINE IS FITTED THE 1/2 BSP THREADED PORT ON THE TANK COVER SHOULD BE BLANKED OFF USING A 120S03 CAP, THE HOPPER RAM RETURN HOSE FROM THE HEADER TANK TERMINATES AT THE1/4 BSP PORT.



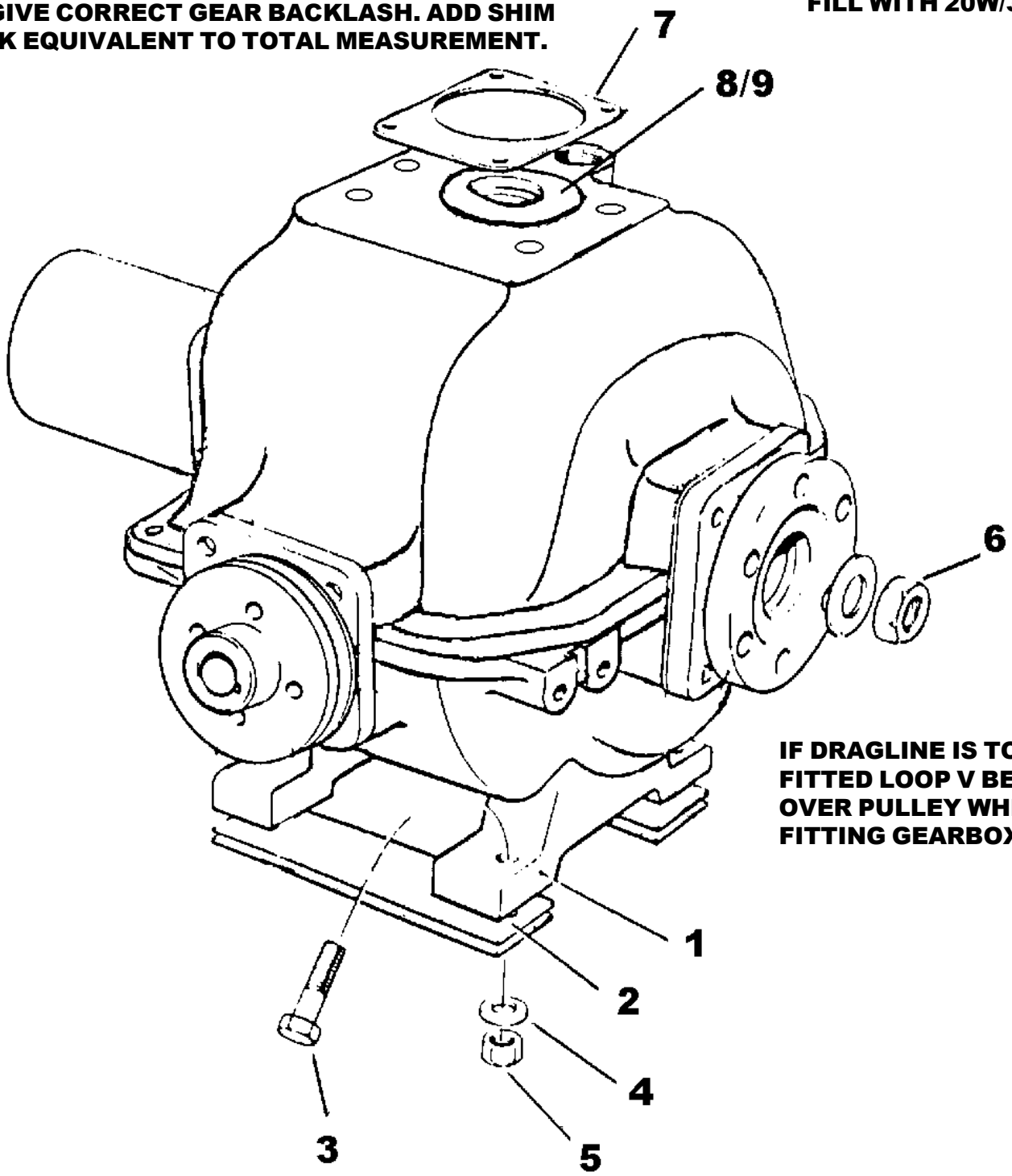
400R HYDRAULIC TANK ASSEMBLY

1	555257900	TANK HYDRAULIC	1
2	555284800	COVER	1
3	555255600	BODY BLEED VALVE	1
4	555264000	GASKET BLEED VALVE	1
5	555267100	SPRING BLEED VALVE	1
6	10565A01	BREATHER FILLER	1
7	220591000	STRAINER	1
8	127S02	PLUG TANK DRAIN	1
8A	100S02	SEAL BONDED	1
9	101120000	BALL STEEL	1
10	100S03	SEAL BONDED	1
11	100S04	SEAL BONDED	1
12	122S03	FITTING ADAPTOR, MALE, STUD	1
13	119S08	FITTING ADAPTOR, MALE, STUD	1
14	417735000	GASKET TANK COVER	1
20	11S04C	SCREW SET	3
21	7S04	NUT	3
22	17S05	WASHER FLAT	3
23	11S02A	SCREW SET	8
24	17S03	WASHER SPRING	6
25	332719000	NUT CAPTIVE	6
26	7S02	NUT	2
27	17S03	WASHER SPRING	2
31	101S07E	RIVET	6

400R REVERSING GEARBOX AND FITTINGS

TO SET BACKLASH BETWEEN HYDRAULIC PUMP AND GEARBOX BEVEL GEARS, ASSEMBLE LOCATING RING AND GEAR ON PUMP AND OFFER PUMP UPTO GEARBOX WITHOUT SHIMS, MEASURE GAP BETWEEN PUMP AND CASTING AND ADD 5-8 THOU (0.02-0.20MM) TO MEASUREMENT OBTAINED TO GIVE CORRECT GEAR BACKLASH. ADD SHIM PACK EQUIVALENT TO TOTAL MEASUREMENT.

FILL WITH 20W/30 OIL



IF DRAGLINE IS TO BE FITTED LOOP V BELT OVER PULLEY WHEN FITTING GEARBOX

CENTRE LINE OF ENGINE AND GEARBOX SHOULD BE ADJUSTED USING SHIM PACK ITEM 2, PLAIN NUTS ON DRIVE COUPLINGS SHOULD BE CHANGED TO BINX NUTS.

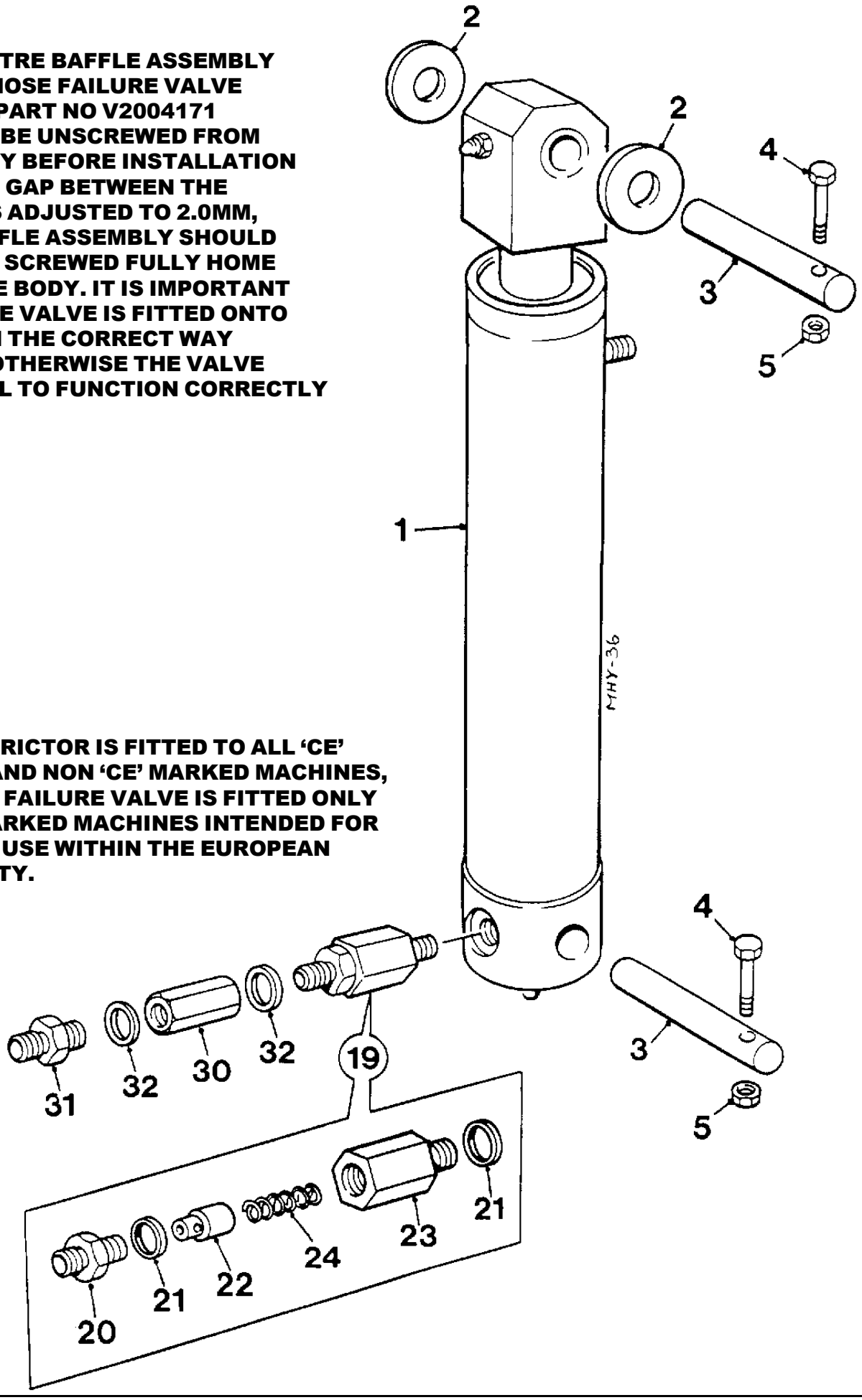
400R REVERSING GEARBOX AND FITTINGS

1	555268100	GEARBOX REVERSING	1
2	555107400	SHIM PACKER SET	1
	CONSISTS OF		
	1 X 555107401		
	1 X 555107402		
	2 X 555107403		
3	6S05F	BOLT	4
4	10S04	WASHER FLAT	4
5	87S05	NUT BINX	4
6	192S07	NUT BINX	2
7		SHIM SET - SUPPLIED WITH GEARBOX	1
8	555106100	GEAR PINION SUPPLIED WITH GEARBOX	1
9	555107000	WASHER CENTRE SUPPLIED WITH GEARBOX	1

400R HOPPER RAM, RESTRICTOR & HOSE FAILURE VALVE

THE CENTRE BAFFLE ASSEMBLY OF THE HOSE FAILURE VALVE ITEM 30 PART NO V2004171 SHOULD BE UNSCREWED FROM THE BODY BEFORE INSTALLATION AND THE GAP BETWEEN THE BAFFLES ADJUSTED TO 2.0MM, THE BAFFLE ASSEMBLY SHOULD THEN BE SCREWED FULLY HOME INTO THE BODY. IT IS IMPORTANT THAT THE VALVE IS FITTED ONTO THE RAM THE CORRECT WAY ROUND OTHERWISE THE VALVE WILL FAIL TO FUNCTION CORRECTLY

THE RESTRICTOR IS FITTED TO ALL 'CE' MARKED AND NON 'CE' MARKED MACHINES, THE HOSE FAILURE VALVE IS FITTED ONLY TO 'CE' MARKED MACHINES INTENDED FOR SALE AND USE WITHIN THE EUROPEAN COMMUNITY.



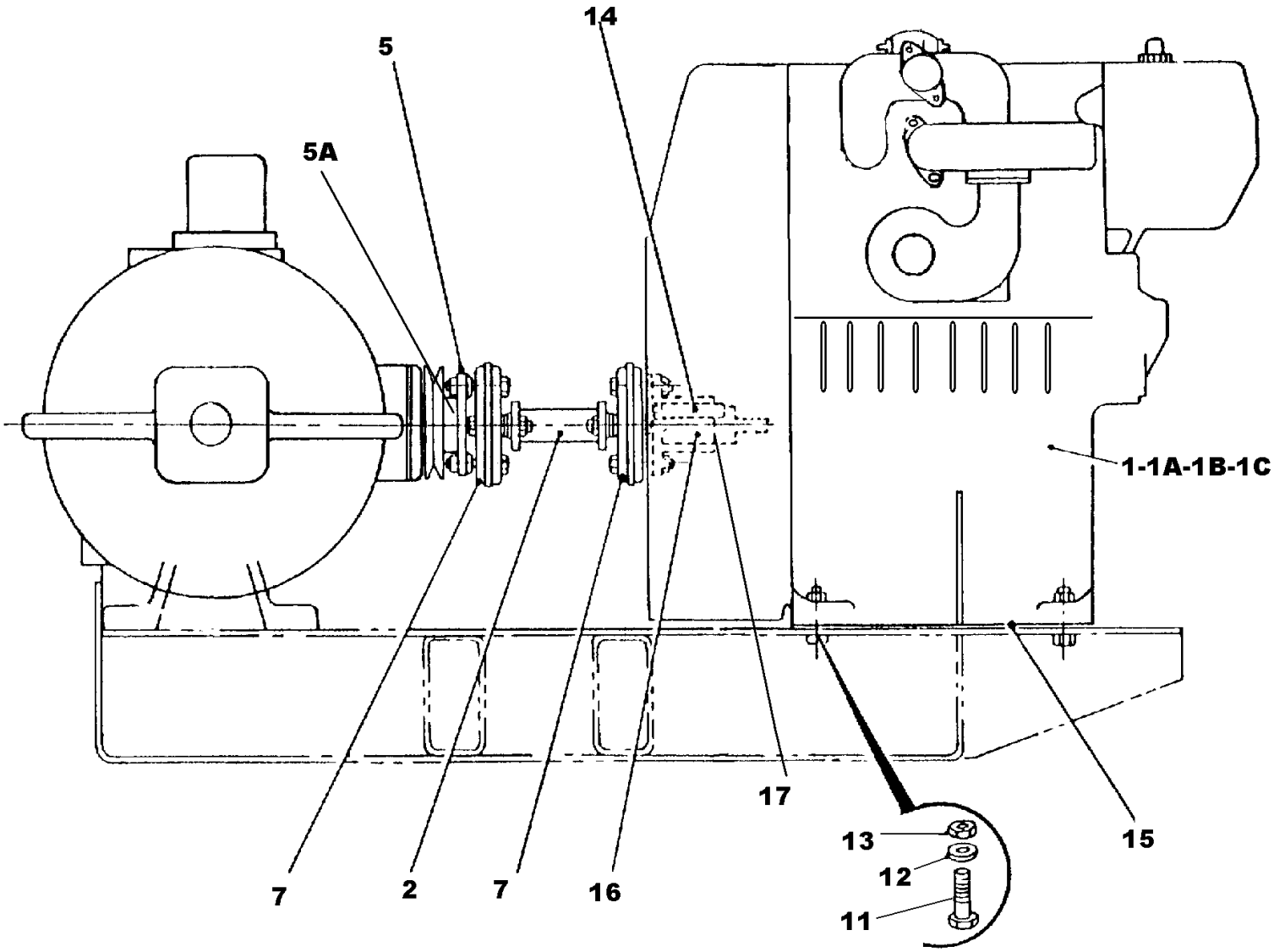
400R HOPPER RAM, RESTRICTOR & HOSE FAILURE VALVE

1	272150000	RAM, HOPPER	1
2	555167900	WASHER	2
3	555108500	PIN	2
4	6S03G	BOLT	2
5	87S03	NUT, "BINX", SELF LOCKING	2
20	119S08	FITTING, ADAPTOR, MALE/MALE	1
21	100S04	SEAL BONDED	2
22	555247000	POPPET	1
23	555247100	FITTING, ADAPTOR, RESTRICTOR	1
24	424210500	SPRING COMPRESSION	1
30	V2004171	VALVE HOSE FAILURE	1
31	122S03	ADAPTOR MALE/MALE	1
32	100S03	SEAL BONDED	2

400R LISTER TR2 ENGINE AND COUPLING

SET ENGINE RPM TO 1800

UK ENGINES MUST BE FILLED WITH 10W/30 ENGINE OIL.



CENTRES OF ENGINE AND GEARBOX OUTPUT/INPUT SHAFTS MUST BE ALIGNED TO AVOID STRAINING SHAFT AND LAYRUB COUPLINGS.

400R ENGINE & COUPLING LISTER TR2

1	20350A03	ENGINE LISTER TR2 HANDSTART (EXPORT VERSION)	1
1A	20350A06	ENGINE LISTER TR2 ELECTRIC START (EXPORT VERSION)	1
1B	20350A07	ENGINE LISTER TR2 HAND START (UK/EEC VERSION)	1
1C	20350A08	ENGINE LISTER TR2 ELECTRIC START (UK/EEC VERSION)	1
2	555280400	SHAFT CONNECTING	1
5	555258100	ADAPTOR DRIVESHAFT	1
5A	90S04H	SCREW SOCKET CAP (NOT ILLUSTRATED)	4
7	130972000	COUPLING LAYRUB	2
11	6S05K	BOLT ENGINE	4
12	10S04	WASHER FLAT	4
13	87S05	NUT BINX "SELF LOCKING"	4
14	304712863	KEY PARALLEL	1
15	555280300	PACKER ENGINE	2
16	555280500	FLANGED DRIVE SHAFT	1
17	195S03C2	SCREW GRUB- FLANGED DRIVE SHAFT	1

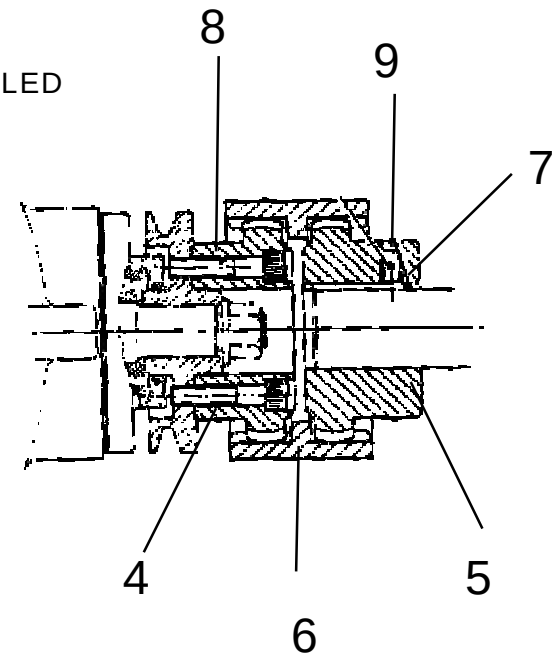
COUPLING FIXINGS

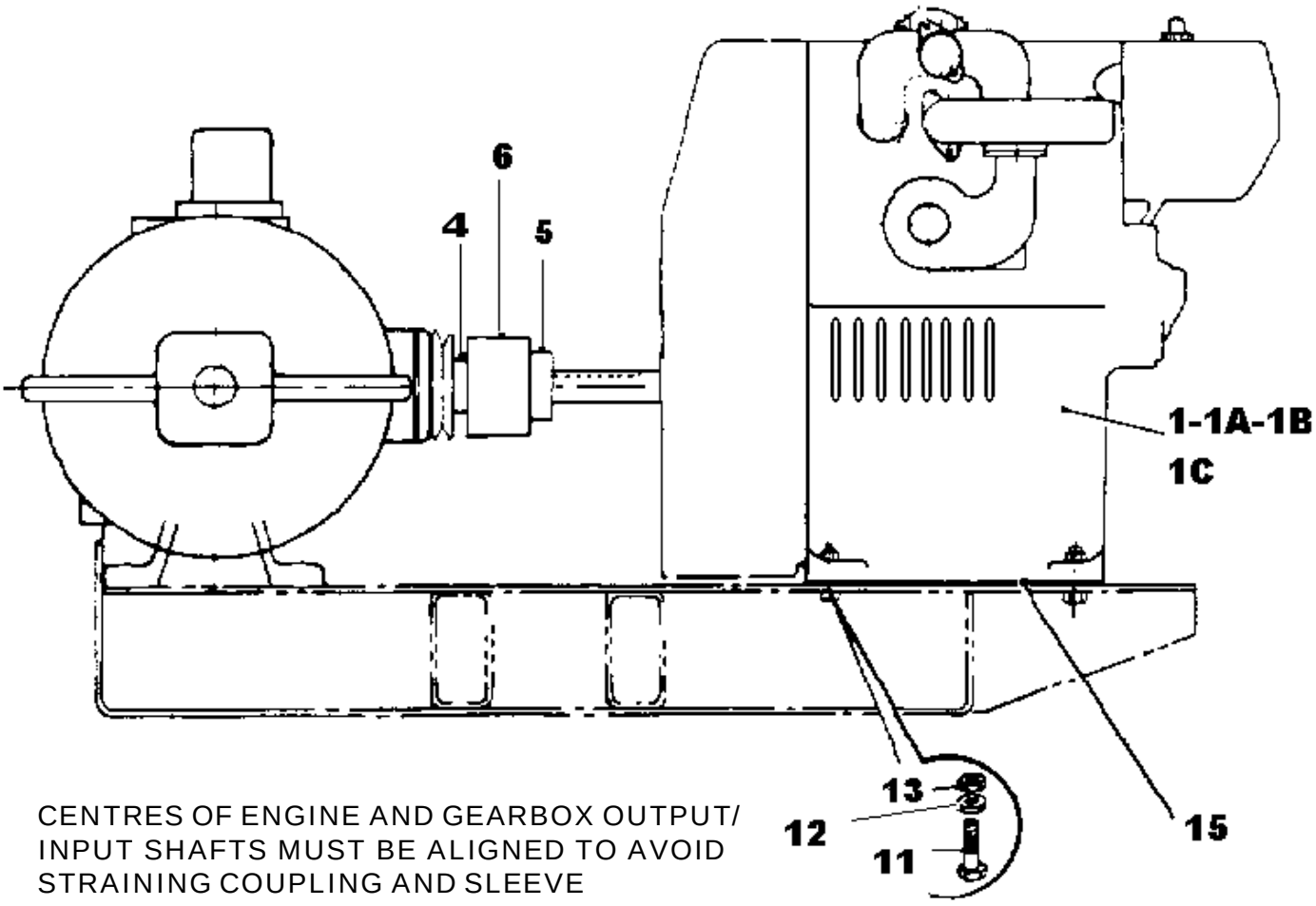
THE NUTS BOLTS AND WASHERS (61S05, 8S05H, 267S07) ARE SUPPLIED WITH THE LAYRUB COUPLINGS ITEM 7 130972000

400R LISTER TR2 ENGINE AND COUPLING APRIL 2010 ON

SET ENGINE RPM TO 1800

UK ENGINES MUST BE FILLED WITH 10W/30 ENGINE OIL.



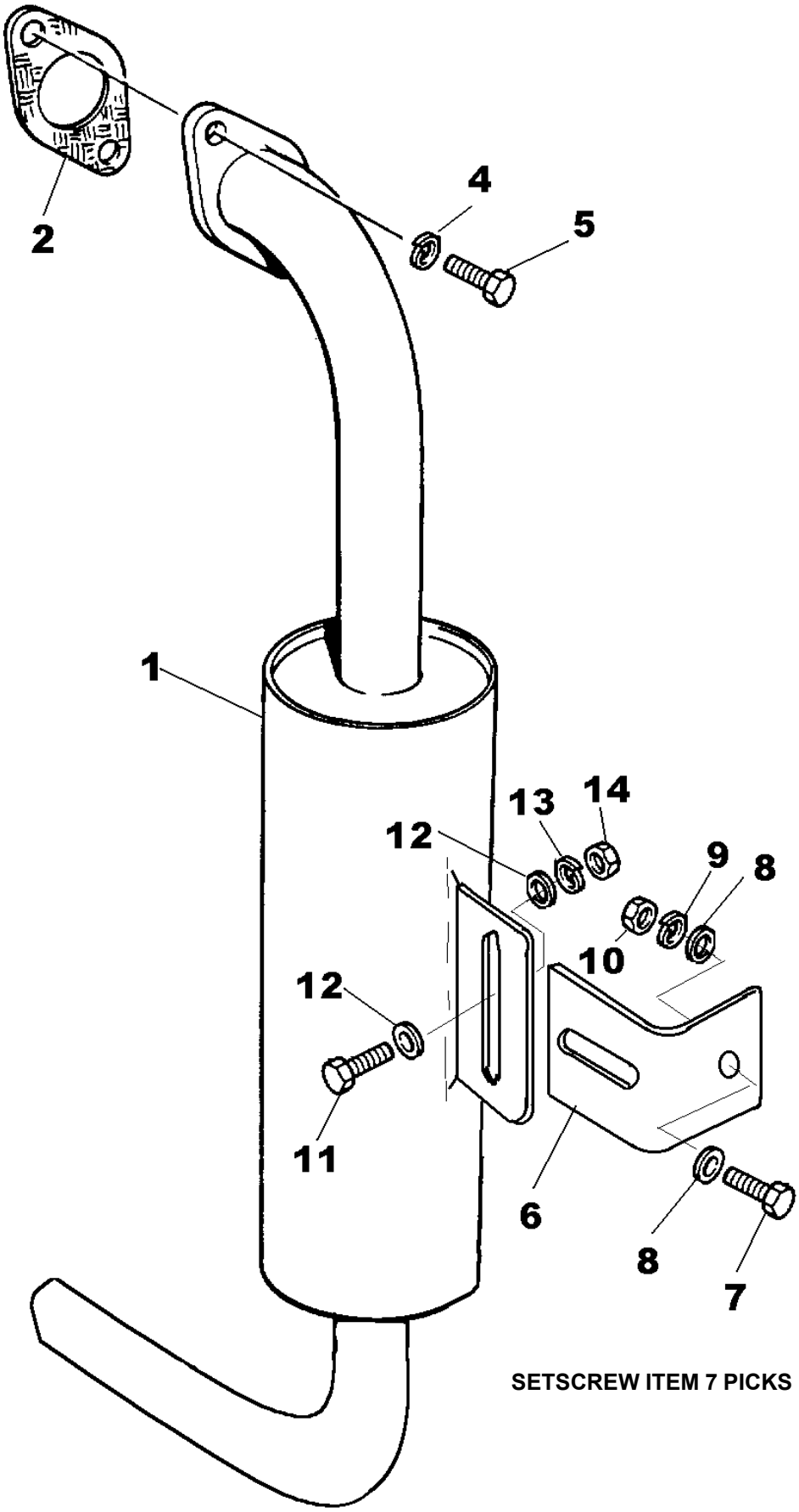


CENTRES OF ENGINE AND GEARBOX OUTPUT/ INPUT SHAFTS MUST BE ALIGNED TO AVOID STRAINING COUPLING AND SLEEVE

400R ENGINE & COUPLING LISTER TR2 APRIL 2010 ON

1	20350A03	ENGINE LISTER TR2 HANDSTART (EXPORT VERSION)	1
1A	20350A06	ENGINE LISTER TR2 ELECTRIC START (EXPORT VERSION)	1
1B	20350A07	ENGINE LISTER TR2 HAND START (UK/EEC VERSION)	1
1C	20350A08	ENGINE LISTER TR2 ELECTRIC START (UK/EEC VERSION)	1
			1
		LONG EXTENSION SHAFT FITTED TO ENGINE	
4	555248601	COUPLING-GEARBOX	1
5	555280900	COUPLING-ENGINE	1
6	147320001	SLEEVE COUPLING-NYLON	1
7	304712863	KEY PARALLEL	1
8	90S04L	SCREW SOCKET CAP	4
9	188S04E1	SCREW GRUB	1
11	6S05K	BOLT ENGINE	4
12	10S04	WASHER FLAT	4
13	87S05	NUT BINX "SELF LOCKING"	4
15	555280300	SHIM PACKER ENGINE	2

400R EXHAUST SILENCER

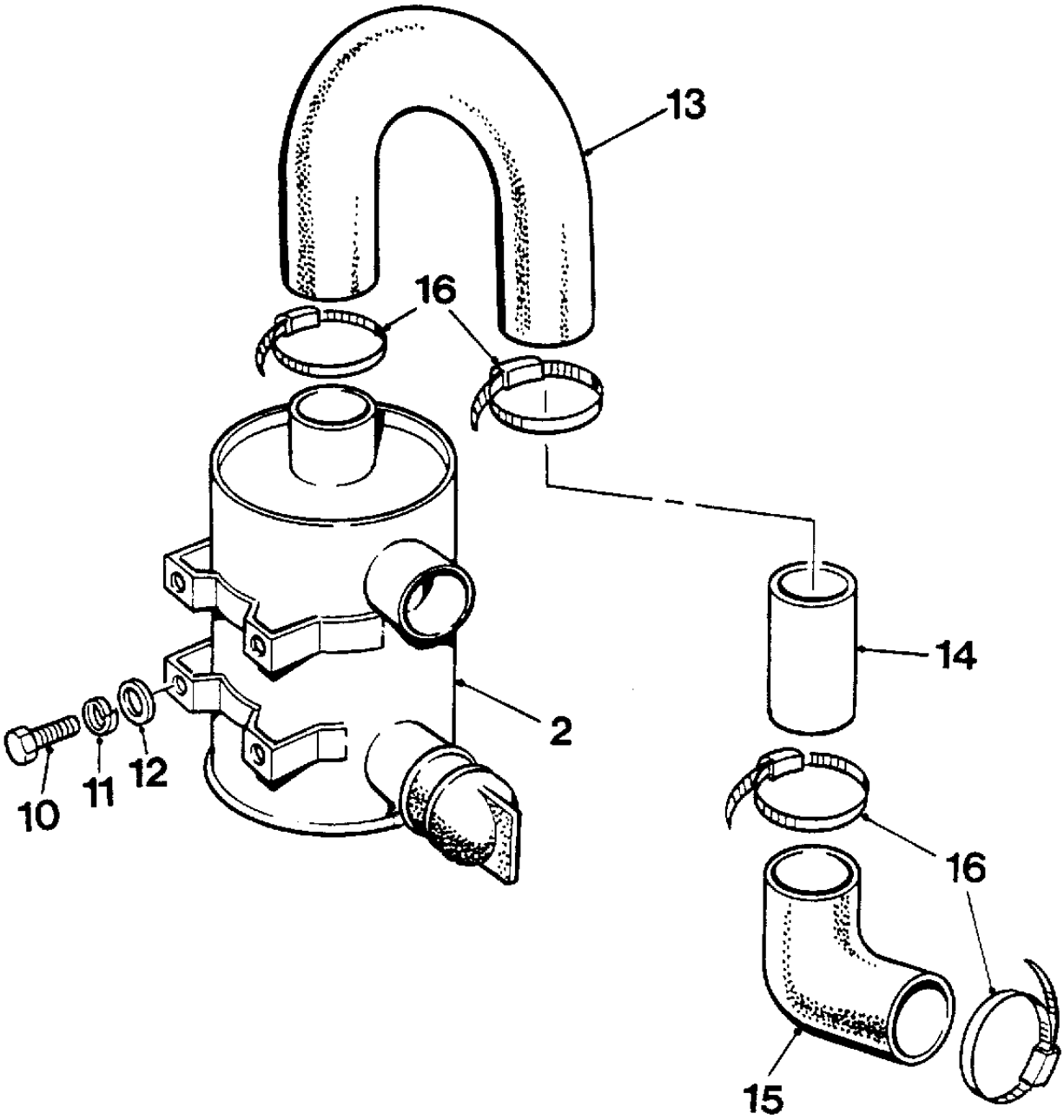


SETSCREW ITEM 7 PICKS UP ON MAINFRAME

400R EXHAUST SILENCER

1	555288900	SILENCER ACOUSTIC EXHAUST	1
2	10293A03	GASKET	1
4	17S05	WASHER SPRING M10	2
5	11S04C	SCREW SET M10	2
6	555289000	BRACKET SILENCER SUPPORT	1
7	11S04F	SCREW SET M10	1
8	267S06	WASHER FLAT M10	2
9	17S05	WASHER SPRING M10	1
10	7S04	NUT M10	1
11	11S04C	SCREW SET M10	1
12	267S06	WASHER FLAT M10	2
13	17S05	WASHER SPRING M10	1
14	7S04	NUT M10	1

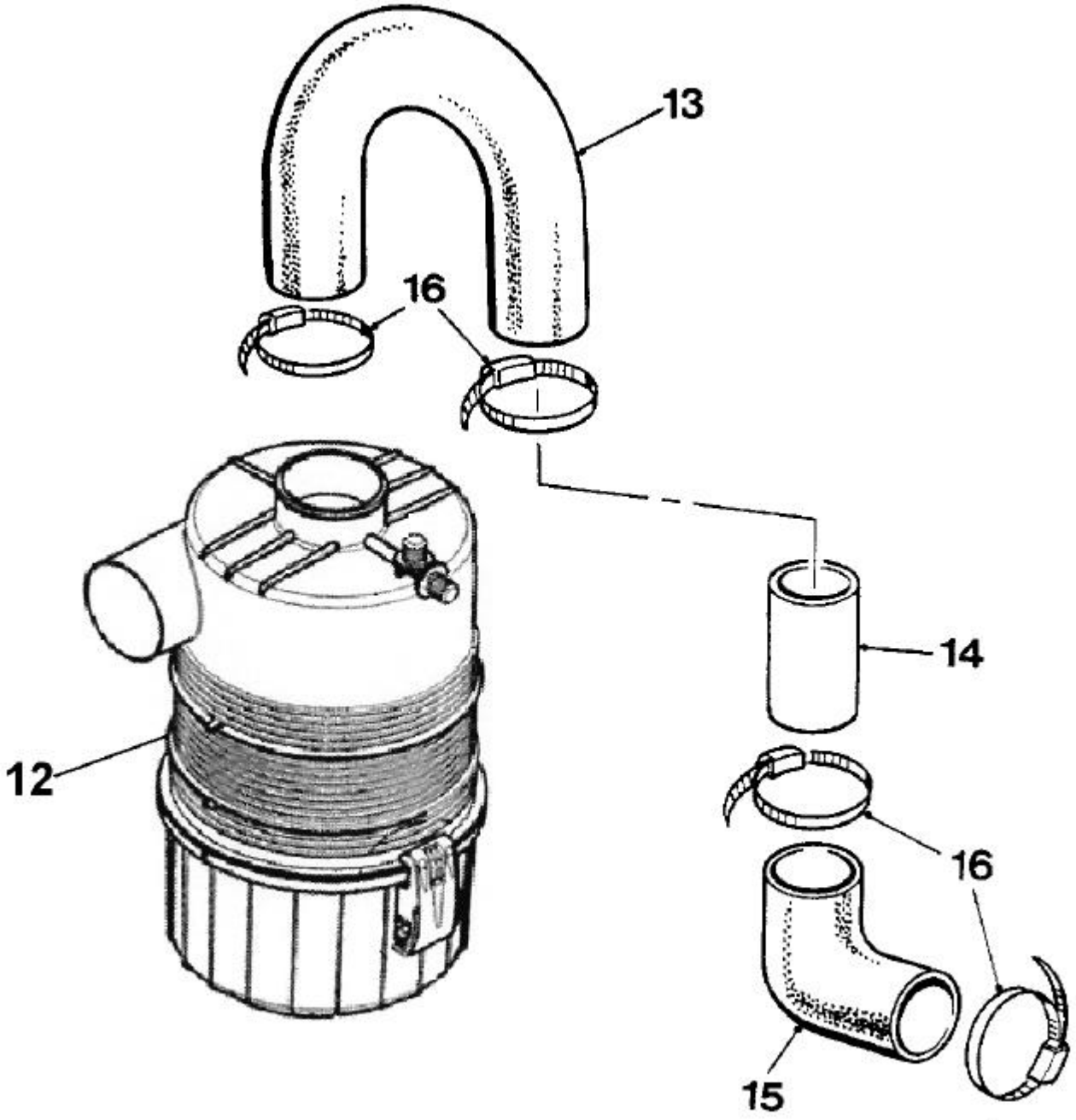
400R AIR CLEANER AND PIPEWORK- FILTREL



400R AIR FILTER AND PIPEWORK-FILTREL

1	V2004797	AIR FILTER ASSEMBLY, FILTREL	1
10	11S03B	SCREW SET	4
11	17S04	WASHER SPRING	4
12	267S05	WASHER FLAT	4
13	555188700	HOSE ELBOW RUBBER INLET	1
14	555280000	TUBE INLET STEEL	1
15	V600187	HOSE ELBOW 90' RUBBER	1
16	97S13	CLIP HOSE	4

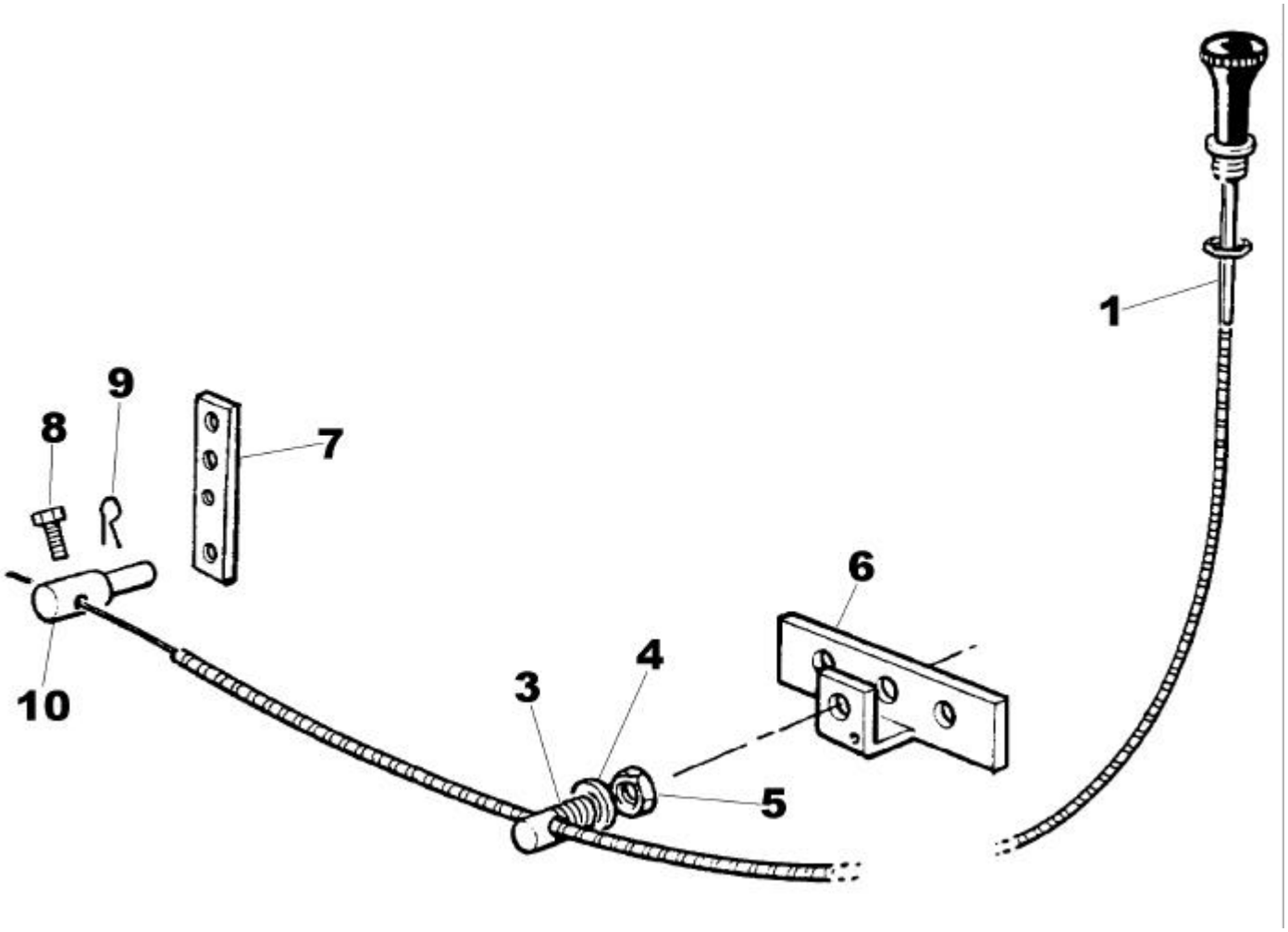
400R AIR CLEANER AND PIPEWORK- VIRGIO



400R AIR FILTER AND PIPEWORK-VIRGIO

12	V2005807	AIR FILTER ASSEMBLY C/W BAND, VIRGIO	1
12A	11S03D	SCREW SET, M8 X 30,	2
12B	267S05	WASHER FLAT	4
12C	61S03	NUT BINX	2
13	555188700	HOSE ELBOW RUBBER INLET	1
14	555280000	TUBE INLET STEEL	1
15	V600187	HOSE ELBOW 90' RUBBER	1
16	97S13	CLIP HOSE	4

400R TR2 ENGINE STOP CABLE



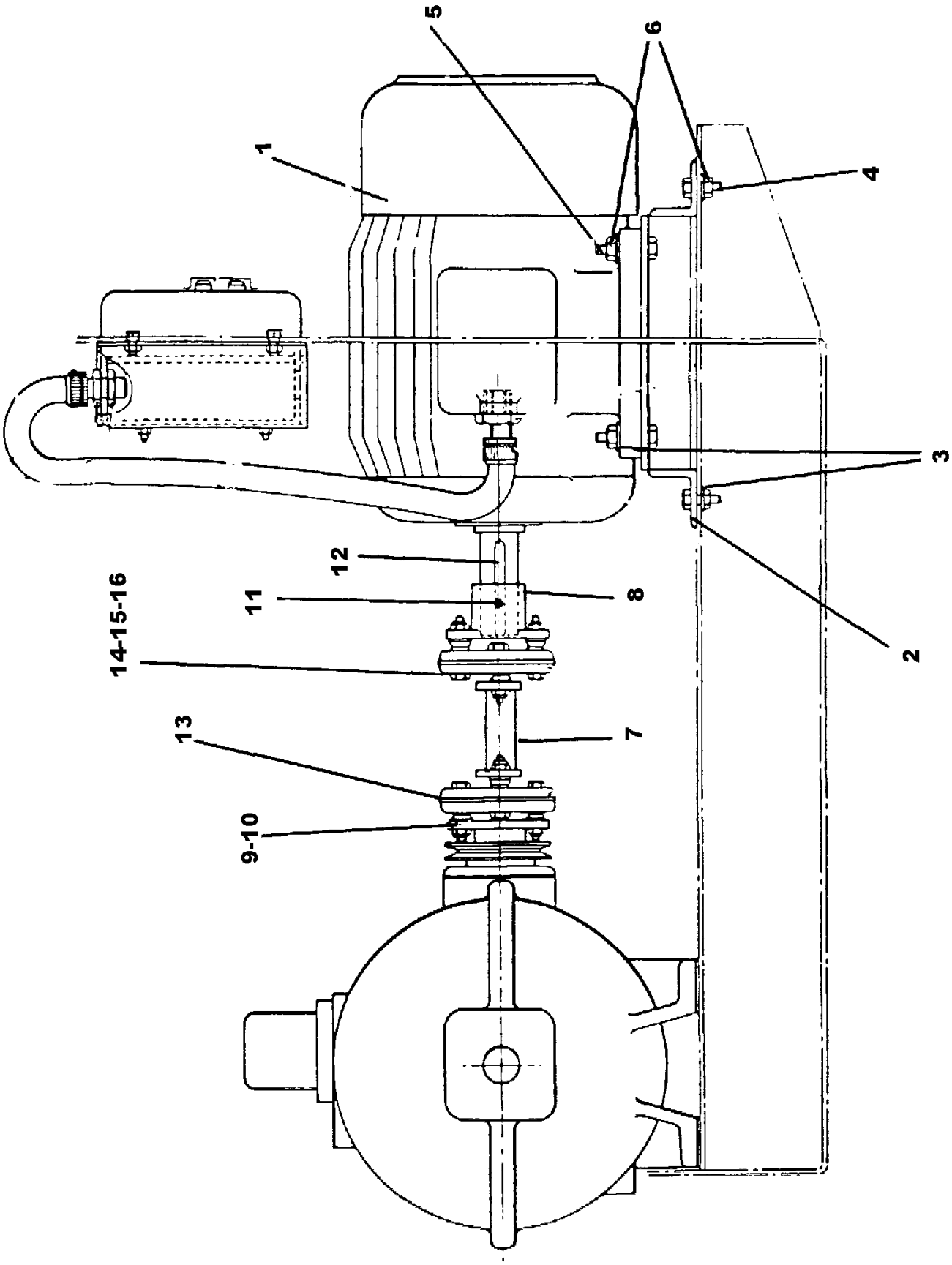
400R TR2 ENGINE STOP CABLE

1	460239	CABLE STOP	1
3	460242	SCREW CLAMP, OUTER CABLE	1
4	67S04	WASHER SHAKEPROOF	1
5	87S03	NUT BINX	1
6	11029A01	BRACKET RETAINING	1
7	11030A01	LEVER PIVOT	1
8	V600192	SCREW SET	1
9	V600193	R CLIP	1
10	V600194	FITTING SWIVEL, INNER CABLE RETAINING	1

PARTS NOT ILLUSTRATED

11	555292300	BRACKET, CABLE STOP	1
12	11S02A	SCREW SET	2
13	267S04	WASHER FLAT	4
14	61S02	NUT BINX	2
15	143200900	CLIP NYLON	1
16	16S05B	SCREW SET	1
17	267S02	WASHER FLAT	1
18	17S10	WASHER SPRING	1
19	7S09	NUT	1

400R 11KW MOTOR AND DRIVE SHAFT 415 VOLT

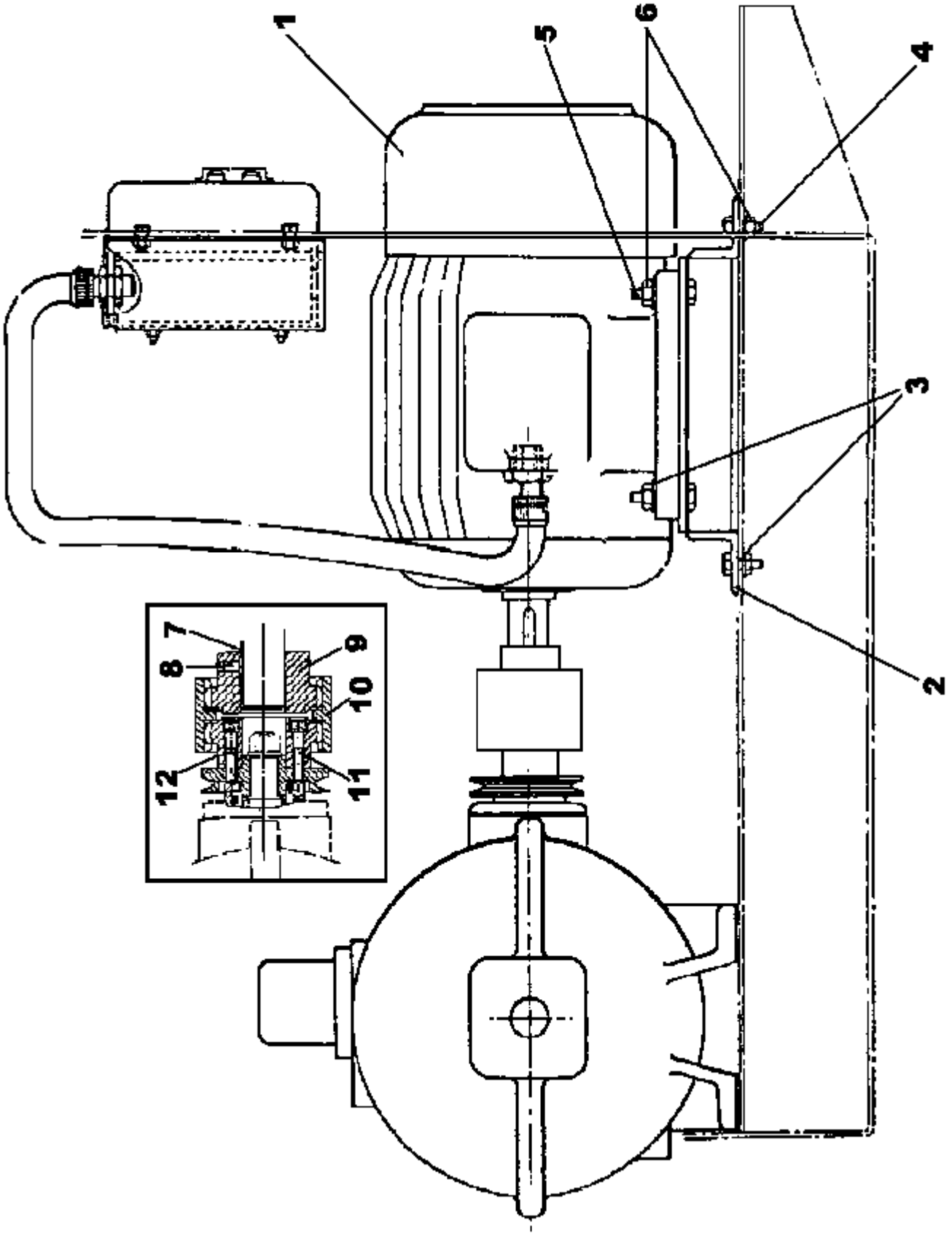


400R 11KW MOTOR AND DRIVE SHAFT 415 VOLT

1	202424000	MOTOR ELECTRIC 11 KW	1
2	555145400	MOUNTING MOTOR	1
3	10S04	WASHER FLAT	8
4	28S05G	SETSCREW	4
5	6S05E	SETSCREW	4
6	87S05	NUT BINX	8
7	555142600	SHAFT CONNECTING	1
8	555145500	FLANGE DRIVE	1
9	555258100	ADAPTOR DRIVE	1
10	90S04H	SCREW CAP	4
11	195S03C2	SCREW GRUB	1
12	304712863	KEY	1
13	130972000	COUPLING LAYRUB	2
14	8S05H	BOLT	8
15	267S07	WASHER FLAT	8
16	61S05	NUT BINX	8

ITEMS 14-15-16 ARE SUPPLIED WITH LAYRUB COUPLING ITEM 13.

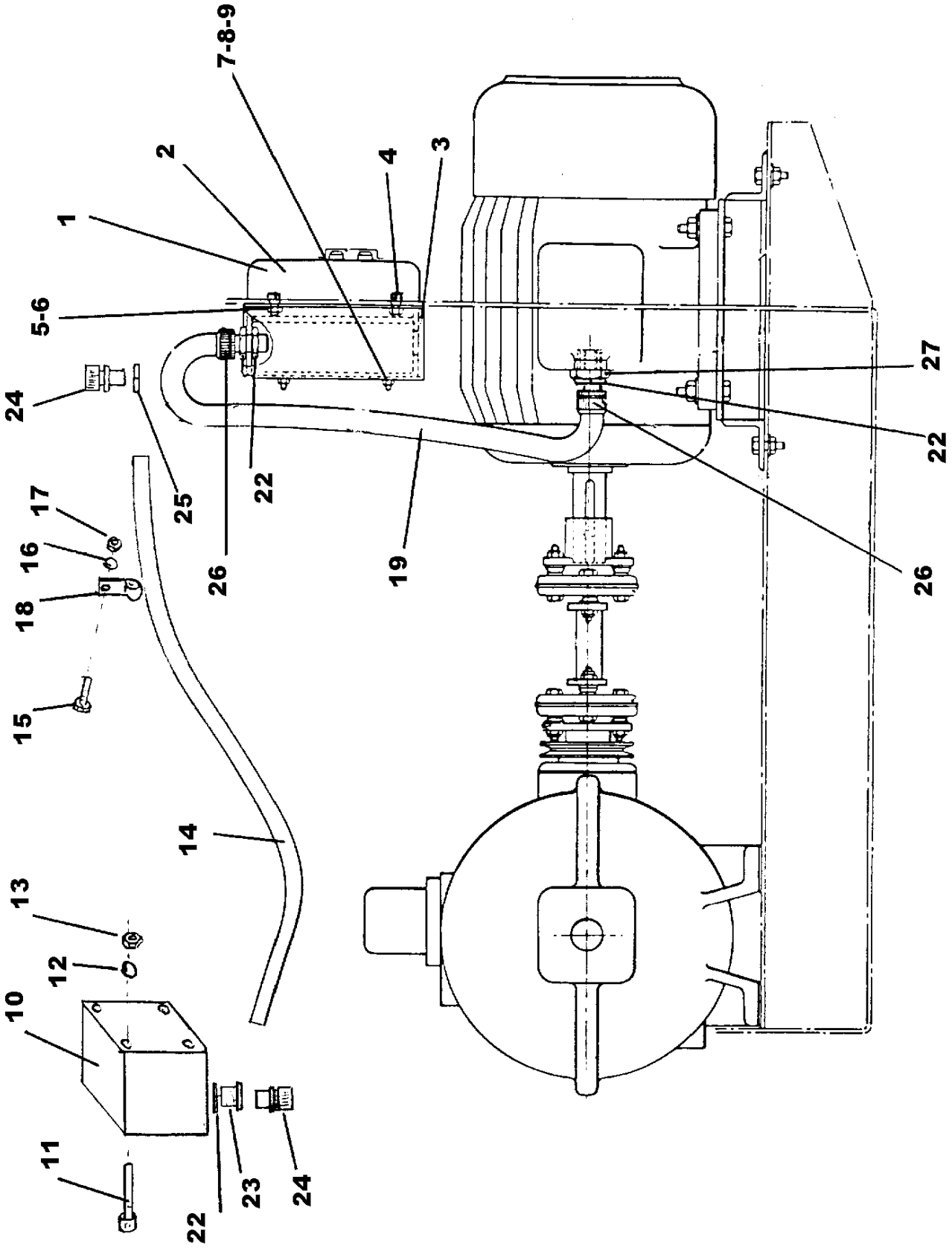
400R 11KW 415V MOTOR AND DRIVE SHAFT LATER TYPE



400R 11KW 415V MOTOR MOUNT DRIVE SHAFT LATER TYPE

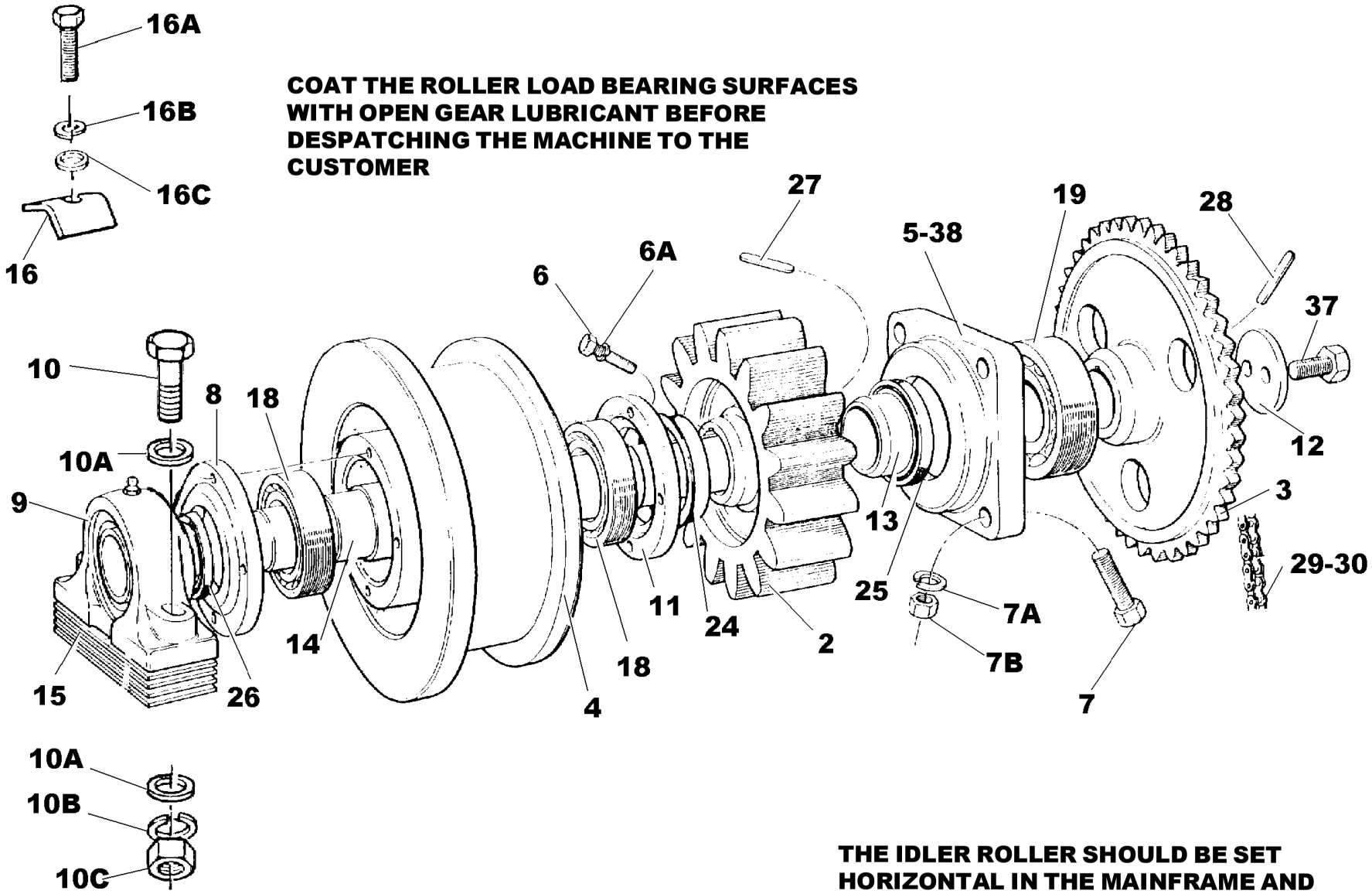
1	202424000	MOTOR ELECTRIC 11 KW	1
2	555145400	MOUNTING MOTOR	1
3	10S04	WASHER FLAT	8
4	28S05G	SETSCREW	4
5	6S05E	SETSCREW	4
6	87S05	NUT BINX	8
7	304712863	KEY	1
8	188S04E1	SCREW GRUB	1
9	555291700	COUPLING MOTOR	1
10	147320001	COUPLING SLEEVE NYLON	1
11	90S04L	SCREW SOCKET HEAD CAP	4
12	555248601	COUPLING GEARBOX	1

400R STARTER AND STOP SWITCH 415 VOLT



400R STARTER AND STOP SWITCH

1	208304103	SWITCH STARTER	1
2	208304104	RELAY OVERLOAD 14A-21A	1
3	555144200	BRACKET STARTER	1
4	6S03B	BOLT	4
4A	CSE182	SPACER (USED TO MOVE BRACKET AWAY FROM MOTOR)	4
5	41S05	WASHER SPRING	4
6	9S03	NUT	4
7	11S02A	SCREW SET	4
8	17S03	WASHER SPRING	4
9	7S02	NUT	4
10	20887000	SWITCH STOP C/W KEYS	1
11	103S02D	SCREW SKT CAP	2
12	41S03	WASHER SPRING	2
13	104S01	NUT	2
14	131770010	CONDUIT 1.5 MTR LONG	1
14A	1444700200	WIRE EARTH GREEN/YELLOW	2MT
14B	144700100	WIRE RED	4MT
15	11S02C	SCREW SET	2
16	17S03	WASHER SPRING	2
17	7S02	NUT	2
18	V2004640	CLIP "P" NORMA 22MM	2
19	131736000	CONDUIT (I MT LONG)	1
20	030788102	WIRE RED	6MT
21	030788103	WIRE EARTH GREEN/YELLOW	1MT
22	133275050	NUT LOCK THIN	3
23	131575020	REDUCER	1
24	131271000	COUPLING KOPEX	2
25	56S07	NUT LOCK THIN	1
26	131272000	COUPLING KOPEX	2
27	131592025	CONVERTER PG29-M25	1



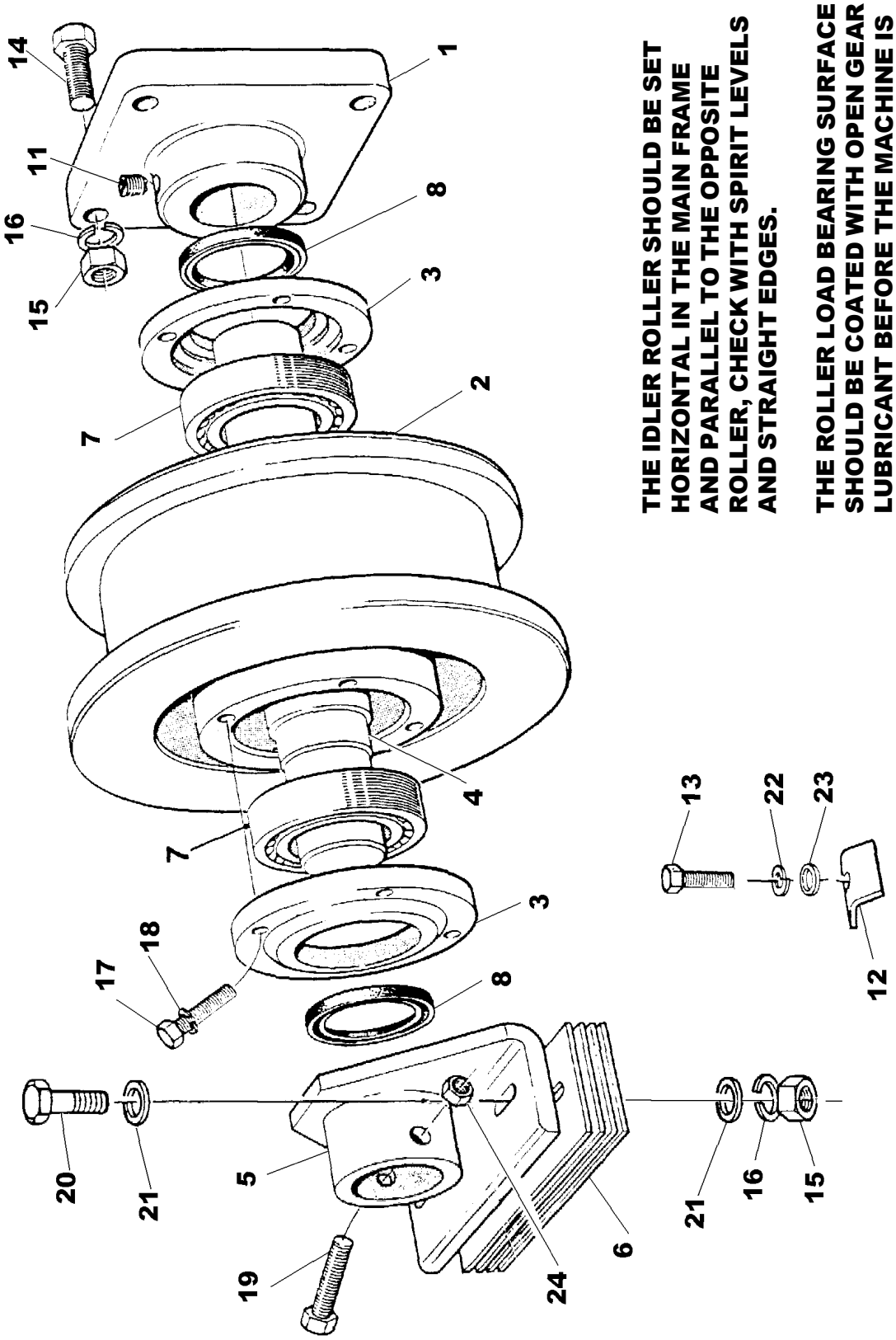
PRIOR TO FITTING BEARINGS ITEM 18 REMOVE SEALS AND PACK BEARINGS WITH A GOOD QUALITY GREASE, WHEN REFITTING THE SEALS ENSURE THEY ARE CORRECTLY SEATED.

THE IDLER ROLLER SHOULD BE SET HORIZONTAL IN THE MAINFRAME AND PARALLEL TO THE OPPOSITE ROLLER, CHECK WITH SPIRIT LEVELS AND STRAIGHT EDGES.

400R DRUM DRIVE SHAFT UPPER

2	555113300	PINION DRUM DRIVE	1
3	555113200	CHAINWHEEL	1
4	555113400	IDLER ROLLER	1
5	555113100	CARRIER BEARING	1
6	66S02A	SCREW SET	8
6A	41S04	WASHER SPRING	8
7	6S05E	BOLT	4
7A	41S07	WASHER SPRING	4
7B	9S04	NUT	4
8	555113500	COVER CAST	1
9	351931000	BLOCK PLUMMER	1
10	6S05H	BOLT	2
10A	10S04	WASHER FLAT	4
10B	41S07	WASHER SPRING	2
10C	9S04	NUT	2
11	555114600	COVER STEEL	1
12	555114400	END CAP DRIVE SHAFT	1
13	555114300	SPACER DRIVE SHAFT	1
14	555113600	SHAFT DRUM DRIVE	1
15	555114900	SHIM PACKER SET	1
16	555272400	BRACKET STOP	1
16A	11S04E	SCREW SET	1
16B	17S05	WASHER SPRING	1
16C	267S06	WASHER FLAT	1
18	88S41D	BEARING-DOUBLE SEAL	2
19	111452000	BEARING	1
24	417773000	SEAL 'V' RING	1
25	417774000	SEAL OIL	1
26	417732440	SEAL OIL	1
27	304213200	KEY PARALLEL	1
28	305108160	KEY PARALLEL	1
29	134911062	CHAIN DIESEL	1
30	134911064	CHAIN ELECTRIC	1
37	555115000	BOLT SPECIAL	2
37A	477356000	WIRE LOCKING	1
38	333601010	NIPPLE GREASE 135	1
38A	176S01	CAP NIPPLE GREASE	2

400R DRUM IDLER ROLLER



PRIOR TO FITTING BEARINGS ITEM 7 REMOVE SEALS PACK WITH A GOOD QUALITY GREASE AND REFIT SEALS ENSURING THEY ARE SEATED CORRECTLY.

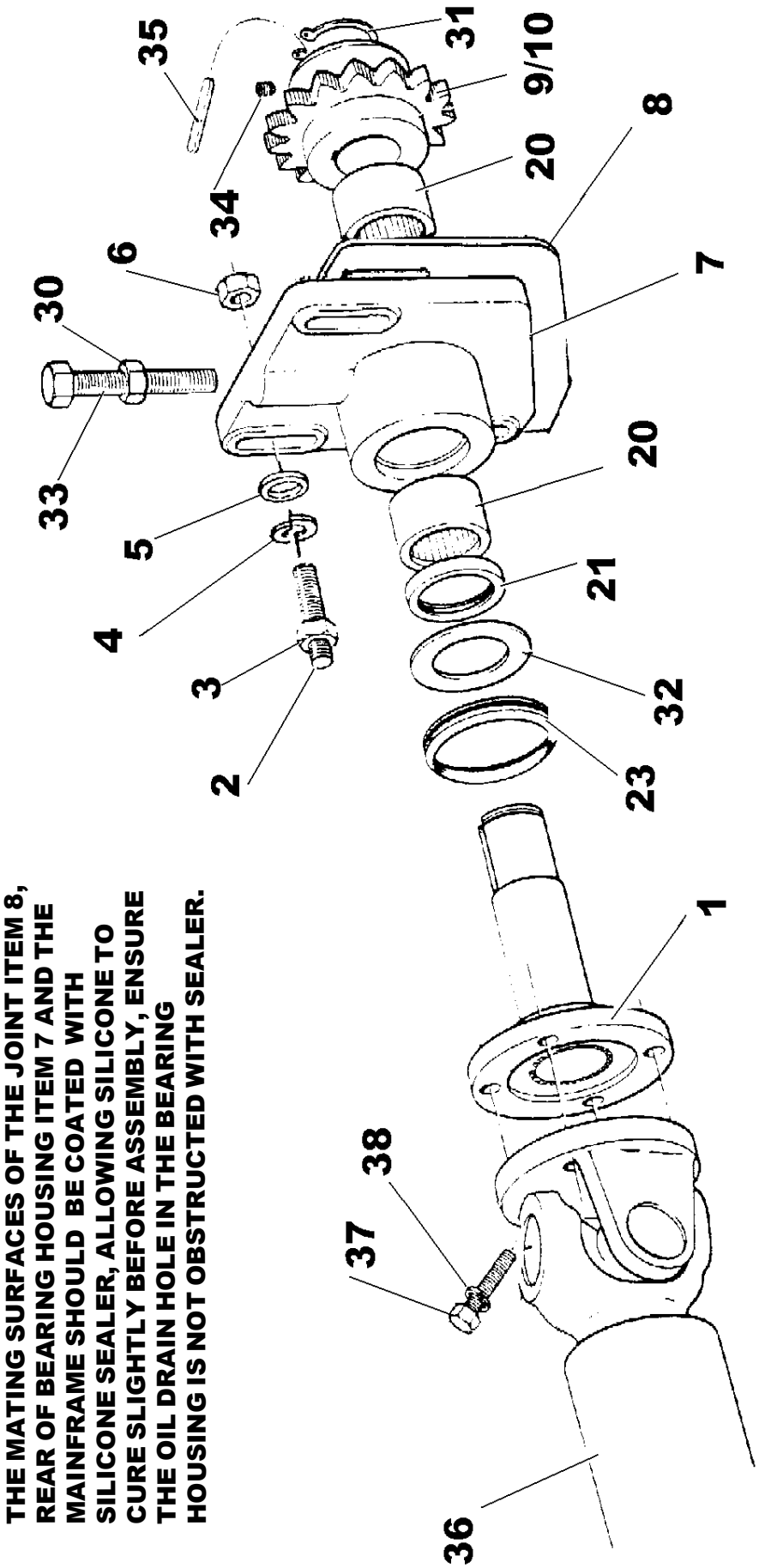
THE IDLER ROLLER SHOULD BE SET HORIZONTAL IN THE MAIN FRAME AND PARALLEL TO THE OPPOSITE ROLLER, CHECK WITH SPIRIT LEVELS AND STRAIGHT EDGES.

THE ROLLER LOAD BEARING SURFACE SHOULD BE COATED WITH OPEN GEAR LUBRICANT BEFORE THE MACHINE IS SHIPPED TO THE CUSTOMER

400R DRUM IDLER ROLLER

1	555113000	CARRIER IDLER SHAFT	1
2	555113400	ROLLER IDLER	1
3	555113500	COVER	2
4	555113700	SHAFT IDLER	1
5	555263700	BRACKET SUPPORT	1
6	555114900	SHIM PACKER SET	1
7	88S41D	BEARING-DOUBLE SEALED	2
8	417732440	SEAL OIL	2
11	188S06D1	SCREW GRUB	1
12	555272400	STOP BRACKET	1
13	11S04E	SCREW SET	1
14	6S05E	BOLT	4
15	9S04	NUT	6
16	41S07	WASHER SPRING	6
17	66S02A	SCREW SET	8
18	41S04	WASHER SPRING	8
19	6S05M	BOLT	1
20	6S05E	BOLT	2
21	10S04	WASHER FLAT	4
22	17S05	WASHER SPRING	1
23	267S06	WASHER FLAT	1
24	87S05	NUT BINX	1

400R DRIVE SHAFT LOWER AND PROPSHAFT



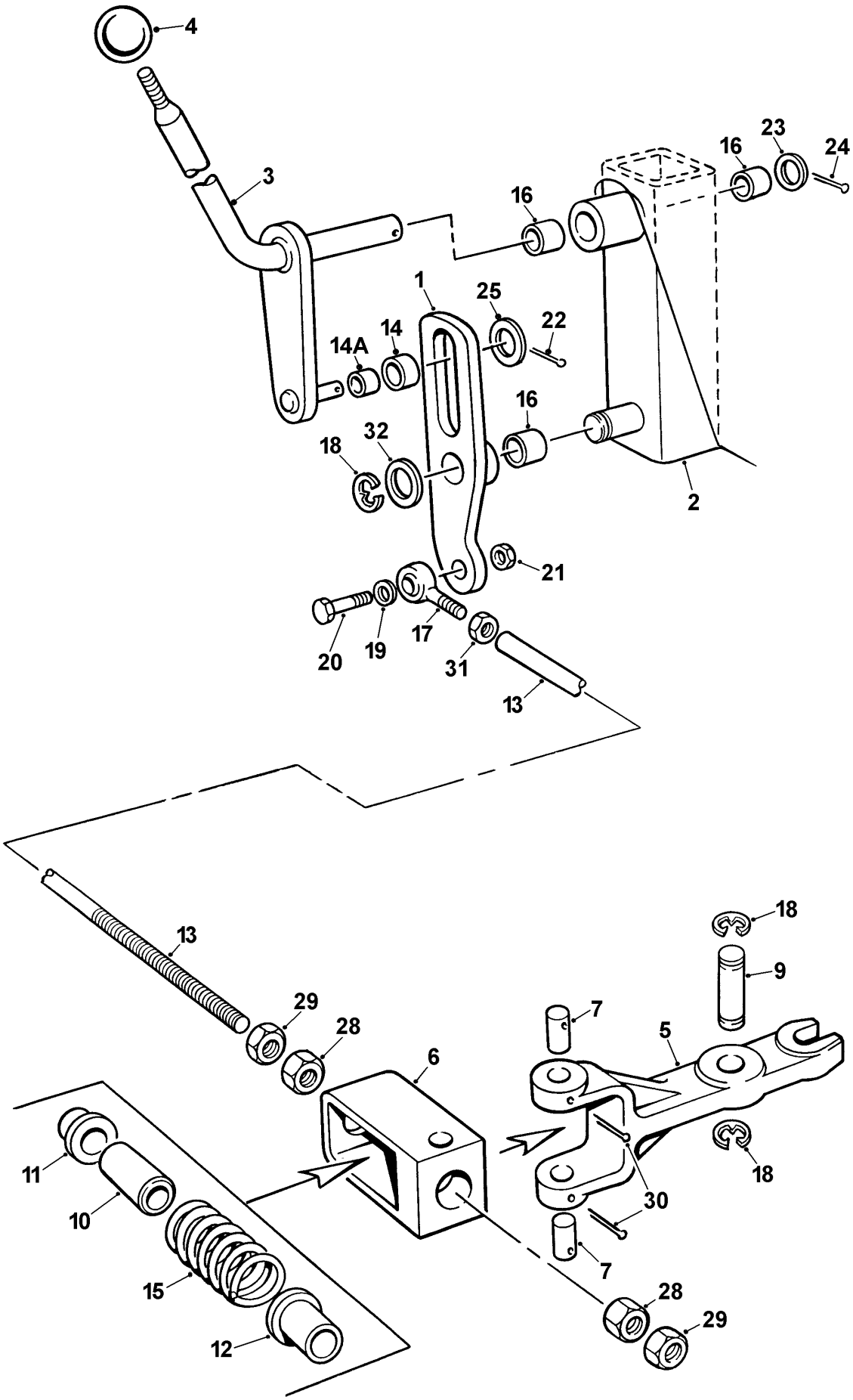
THE MATING SURFACES OF THE JOINT ITEM 8, REAR OF BEARING HOUSING ITEM 7 AND THE MAINFRAME SHOULD BE COATED WITH SILICONE SEALER, ALLOWING SILICONE TO CURE SLIGHTLY BEFORE ASSEMBLY, ENSURE THE OIL DRAIN HOLE IN THE BEARING HOUSING IS NOT OBSTRUCTED WITH SEALER.

THE CHAIN SHOULD BE ADJUSTED BY THE USE OF SET SCREW ITEM 33 BEFORE THE BEARING HOUSING ITEM 7 IS LOCKED IN PLACE BY NUTS ITEM 3

400R DRIVE SHAFT - LOWER AND PROPSHAFT

1	555257700	SHAFT DRIVE FLANGED	1
2	V601338	STUD	3
3	7S05	NUT	3
4	17S06	WASHER SPRING	3
5	267S07	WASHER FLAT	3
6	61S05	NUT BINX	3
7	555112900	BRACKET BEARING ADJUSTABLE	1
8	555284900	GASKET	1
9	555114100	SPROCKET - DIESEL	1
10	555114000	SPROCKET - ELECTRIC	1
20	113149000	BEARING NEEDLE ROLLER	2
21	417302000	SEAL OIL	1
23	417772000	SEAL 'V' RING	1
30	95S05	NUT	1
31	142330000	CIRCLIP EXTERNAL	1
32	463935240	WASHER THRUST	1
33	28S05N	SCREW SET	1
34	188S03C2	SCREW GRUB	1
35	304106230	KEY PARALLEL	1
36	412818400	PROPSHAFT	1
37	11S03B	SCREW SET	12
38	17S04	WASHER SPRING	12
39	176S01	CAP NIPPLE GREASE (NOT ILLUSTRATED)	3

400R DRUM AND GEARBOX CONTROLS

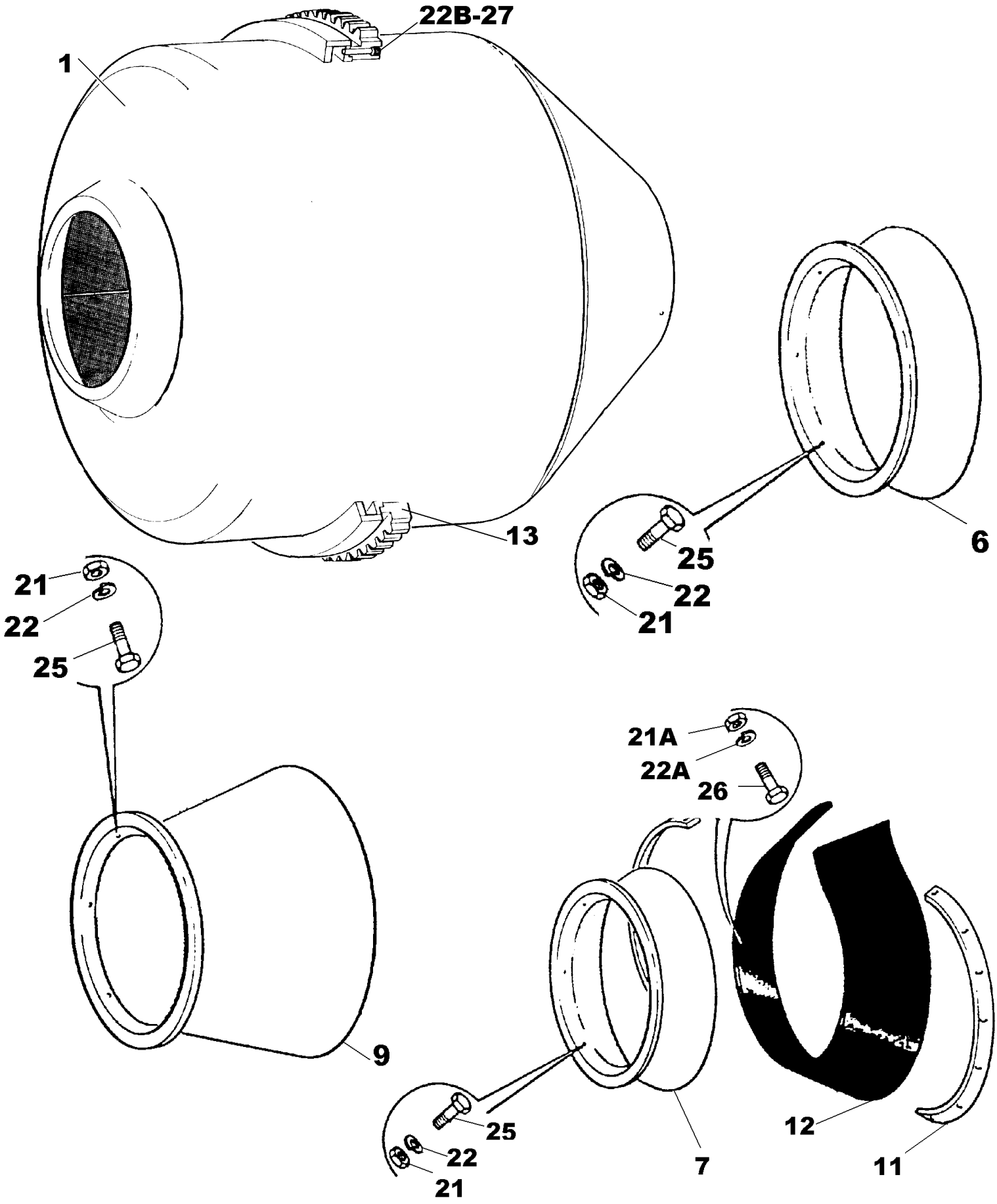


400R DRUM AND GEARBOX CONTROLS

1	555110100	LEVER SLOTTED	1
3	555292100	LEVER HAND 5/8" UNC THREAD	1
3	555292100	LEVER HAND M12 THREAD	1
4	307126000	KNOB 5/8" UNC THREAD	1
4	307126000	KNOB M12 THREAD	1
5	555110400	LEVER OPERATING	1
6	555110500	BLOCK CLEVIS PIN	1
7	555110600	PIN CLEVIS	1
9	555110800	PIN PIVOT	1
10	555110900	SLEEVE	1
11	555111000	GLAND SLIDING SHORT	1
12	555111100	GLAND SLIDING LONG	1
13	555111200	ROD CONNECTING	1
14	555111300	ROLLER	1
15	555111400	SPRING COMPRESSION	1
16	112800200	BUSH	3
17	383251000	ROD END BEARING	1
18	132412010	CIRCLIP	3
20	6S05E	BOLT	1
21	87S05	NUT BINX	1
22	44S02E	PIN SPLIT	1
23	10S18	WASHER FLAT	1
24	44S05D	PIN SPLIT	1
25	10S04	WASHER FLAT	1
28	9S06	NUT	2
29	95S07	NUT LOCKING THIN	2
30	44S03F	PIN SPLIT	2
31	95S05	NUT LOCKING	1
32	10S18	WASHER FLAT	1

TO SET DRUM CLUTCH:- SET CONTROL LEVER IN CHARGE POSITION AND ADJUST NUT ITEM 28 SO THAT 3mm (1/8") OF LONG SLIDING GLAND ITEM 12 PROTRUDES BEYOND THE END OF CLEVIS ITEM 6. REPEAT WITH LEVER IN DISCHARGE POSITION BUT ADJUST NUTS TO ALLOW 3mm (1/8") OF SHORT SLIDING GLAND TO PROTRUDE BEYOND CLEVIS. LOCK NUTS ON COMPLETION.

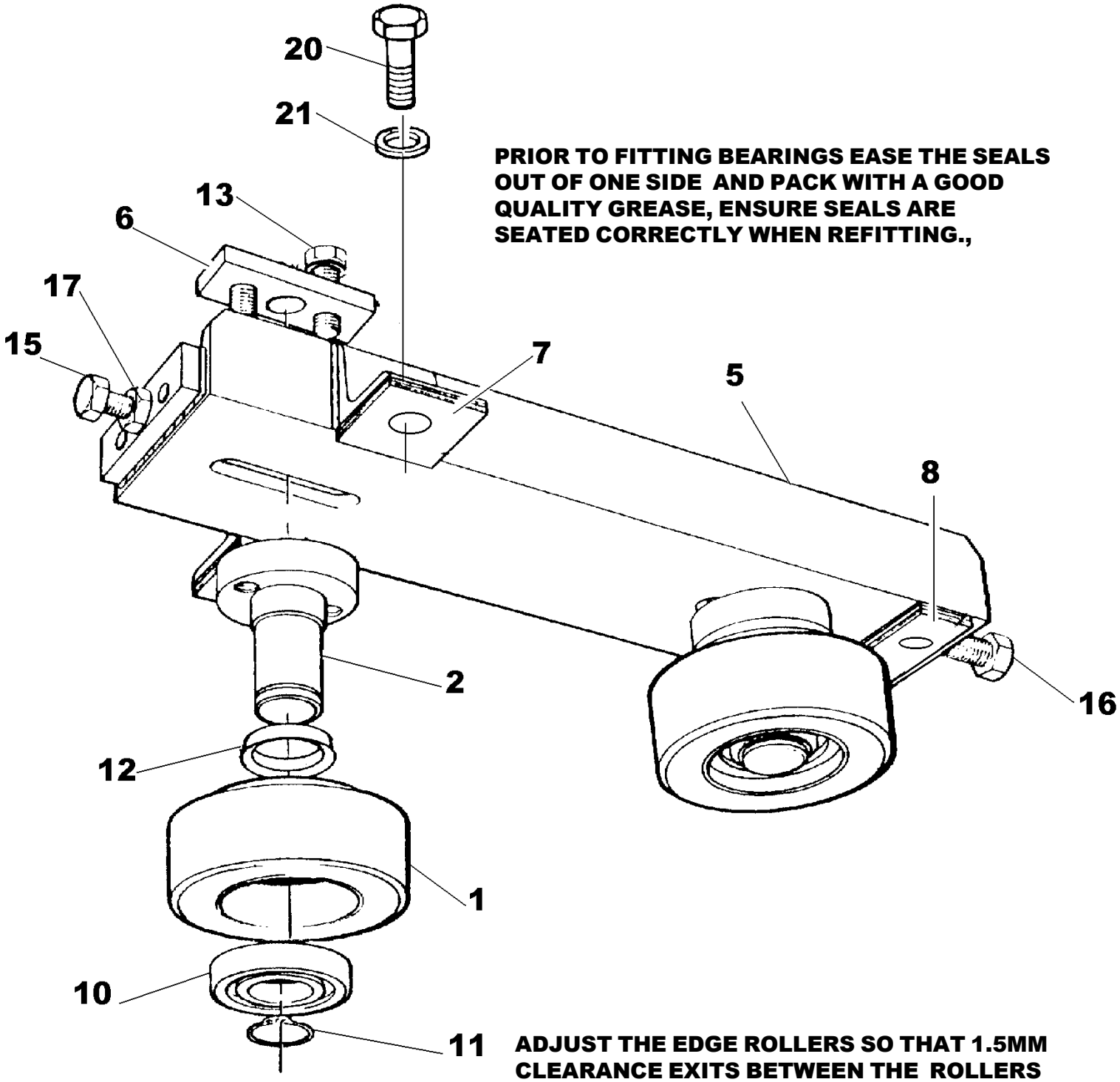
400R DRUM , DRUM MOUTH & EXTENSION CONES



400R DRUM ASSEMBLY DRUM MOUTH + EXTEN CONES

1	555280700	DRUM ASSEMBLY INC BLADES AND TRACK RING	1
6	555126000	CONE DRUM MOUTH STND	1
7	555127800	CONE DRUM MOUTH-USE WITH RUBBER EXTENSION	1
9	555127700	CONE DRUM MOUTH-STEEL EXTENSION	1
11	515143000	STRAP RETAINING (SET OF FOUR)	1
12	515142900	CONE EXTENSION RUBBER	1
13	555112700	GEAR RING CAST	1
21	104S05	NUT	6
21A	104S05	NUT, (RUBBER RETAINING)	14
21B	10S04	WASHER FLAT, RUBBER RETAINING, (NOT ILLUSTRATED)	14
22	41S07	WASHER SPRING	6
22A	41S07	WASHER SPRING (RUBBER RETAINING)	14
22B	41S07	WASHER SPRING (GEAR RING)	8
25	200S05G	SCREW SLOTTED ROUND HEAD	6
26	206S05C	SCREW SLOTTED COUNTERSUNK	14
27	90S06R	SCREW SOCKET CAP	8

400R DRUM EDGE ROLLERS



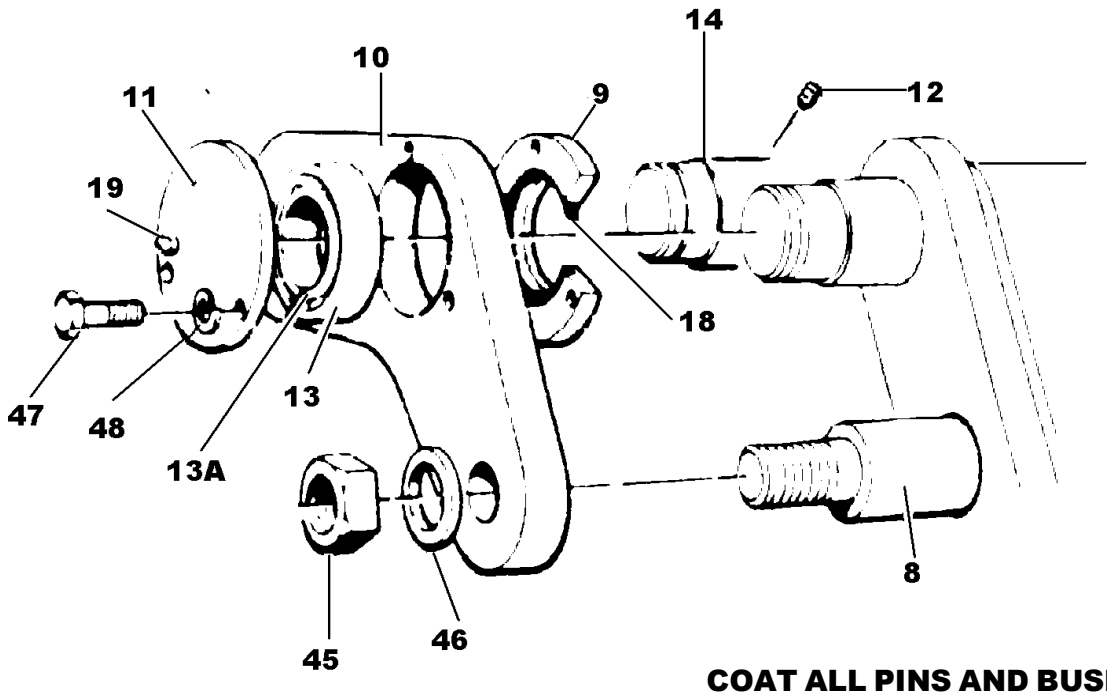
PRIOR TO FITTING BEARINGS EASE THE SEALS OUT OF ONE SIDE AND PACK WITH A GOOD QUALITY GREASE, ENSURE SEALS ARE SEATED CORRECTLY WHEN REFITTING.,

ADJUST THE EDGE ROLLERS SO THAT 1.5MM CLEARANCE EXITS BETWEEN THE ROLLERS AND DRUM TRACK RING, SETTING THE ROLLERS TO TIGHT WILL LEAD TO PREMATURE FAILURE OF THE BEARINGS. THE SET SCREWS SECURING THE ROLLER ASSEMBLIES TO THE CARRIER SHOULD BE LOCKED TOGETHER USING THE WIRE TIES FOLLOWING ADJUSTMENT.

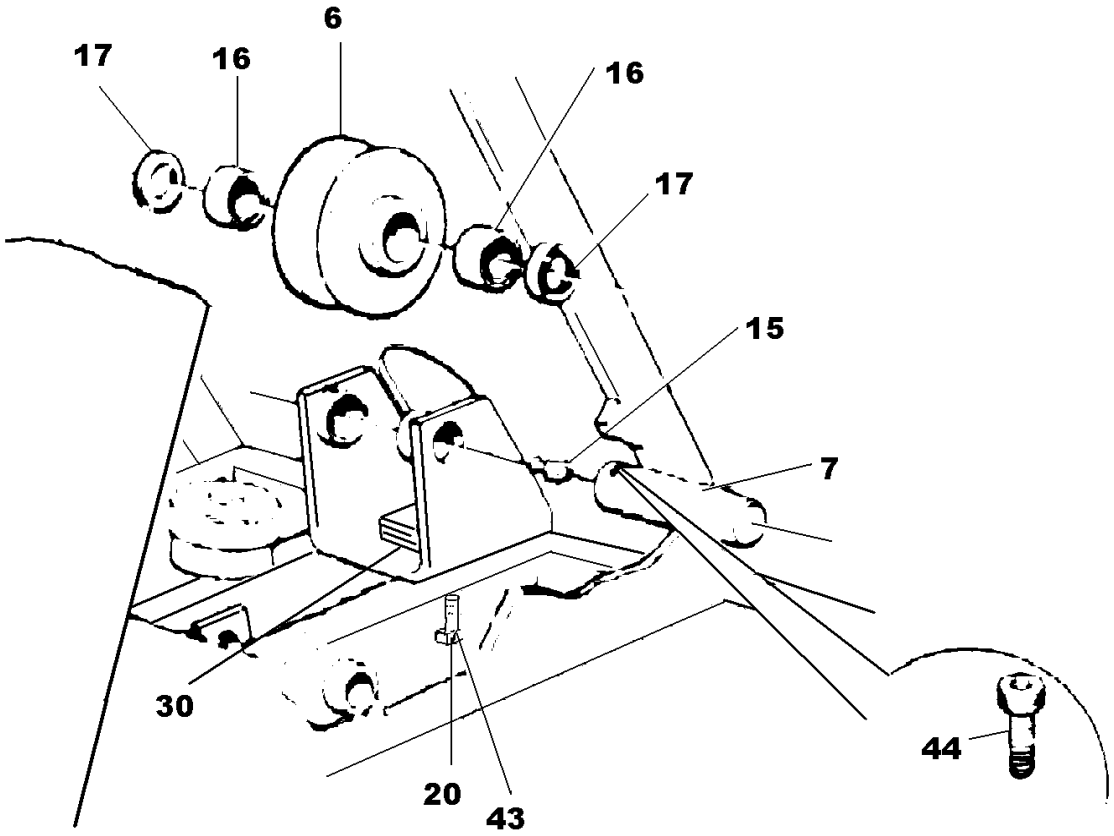
400R DRUM EDGE ROLLERS

1	555111700	ROLLER EDGE	2
2	555283700	SHAFT EDGE ROLLER	2
5	555111800	CARRIER EDGE ROLLER	1
6	555112000	PLATE LOCKING	2
7	555112100	SHIM PACKER SHORT	12
8	555112200	SHIM PACKER LONG	6
10	88S05D	BEARING	2
11	142321000	CIRCLIP	2
12	417771000	SEAL 'V' RING	2
13	555167500	SCREW SET SPECIAL	4
14	477356000	WIRE LOCKING (NOT ILLUSTRATED)	2
15	28S05K	SCREW SET ADJUSTING	1
16	28S05U	SCREW SET ADJUSTING	1
17	95S05	NUT LOCKING	2
20	6S05E	BOLT	4
21	41S07	WASHER SPRING	4

400R CRADLE LINK ARMS & BATCHWEIGHER GUIDE



COAT ALL PINS AND BUSHES WITH COPPERSLIP ON ASSEMBLY. CHARGE ALL GREASE POINTS .

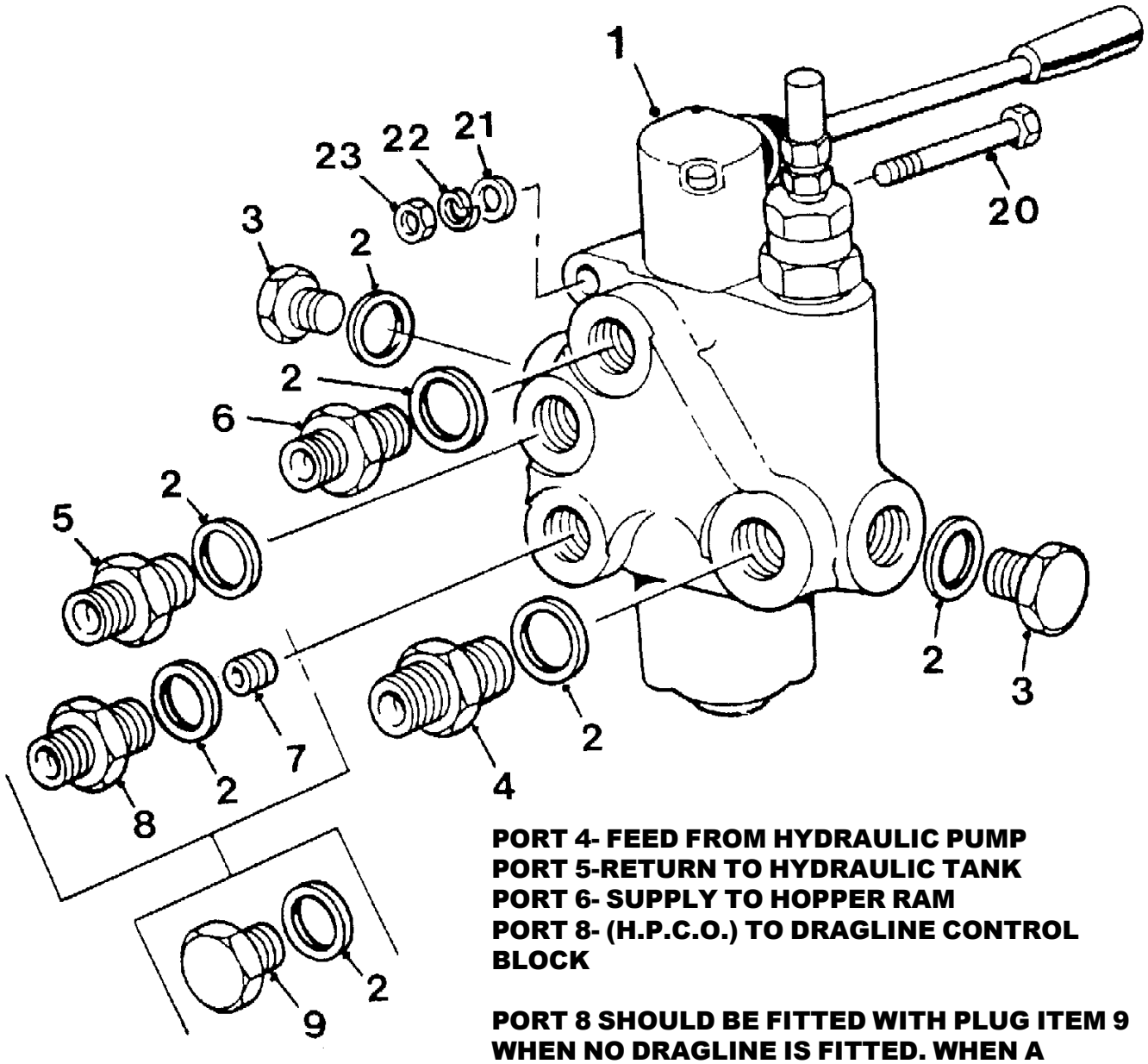


400R HOPPER CRADLE LINK ARMS & BATCHWEIGHER GUIDE

6	555108900	GUIDE-LOADCELL STRIKER	1
7	555109000	PIN GUIDE	1
8	555255100	SHAFT LINK	1
9	555255300	HOUSING BEARING	4
10	555255000	ARM LINK	1
11	555255400	CAP BEARING	4
12	195S04E2	SCREW GRUB	2
13	113179200	BEARING NEEDLE	4
13A	113179201	BEARING NEEDLE INNER	4
14	555255200	SHAFT PIVOT	1
15	333506000	NIPPLE GREASE	1
15A	176S01	COVER NIPPLE GREASE	1
16	113149000	BEARING NEEDLE	2
17	422702000	SEAL GREASE	2
18	49S40	SEAL 'O' RING	4
19	131S01	NIPPLE GREASE	4
19A	176S01	COVER NIPPLE GREASE	4
20	11S05E	SCREW SET	1
30A	512118301	SHIM PACKER	3
30B	512118302	SHIM PACKER	3
30C	512118303	SHIM PACKER	3
43	17S06	WASHER SPRING	1
44	195S04D3	SCREW GRUB	1
45	9S11	NUT	2
46	10S31	WASHER FLAT	2
47	8S03E	BOLT	12
48	17S04	WASHER SPRING	12
49	555269600	HOPPER CRADLE (ALL BUILDS)	1

400R HYDRAULIC CONTROL VALVE (MHS-DINOIL)

THE HYDRAULIC PRESSURE SHOULD BE ADJUSTED :- 2000 PSI (138 BAR) 400R
2400 PSI (166 BAS) 500R



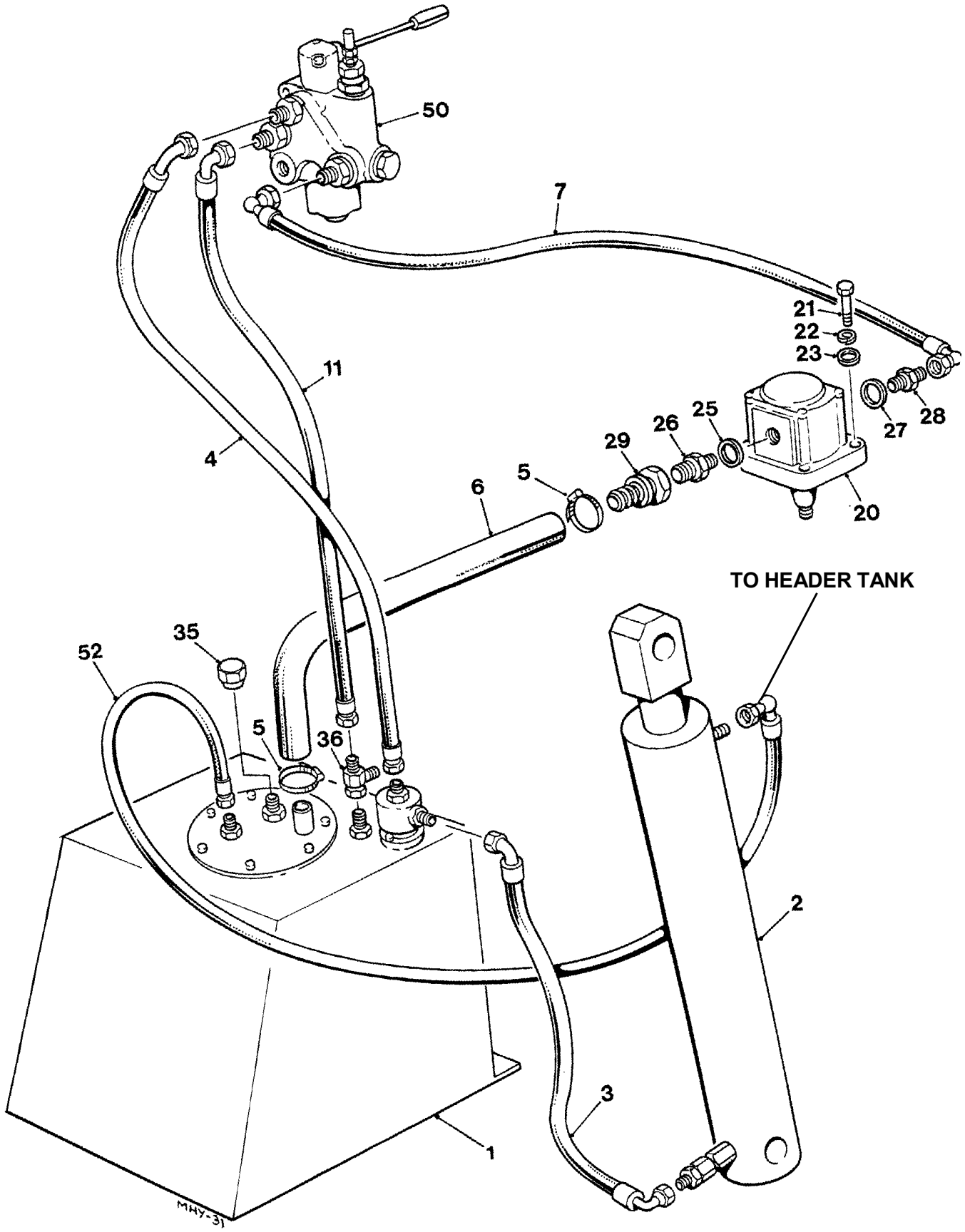
PORT 4- FEED FROM HYDRAULIC PUMP
PORT 5-RETURN TO HYDRAULIC TANK
PORT 6- SUPPLY TO HOPPER RAM
PORT 8- (H.P.C.O.) TO DRAGLINE CONTROL BLOCK

PORT 8 SHOULD BE FITTED WITH PLUG ITEM 9 WHEN NO DRAGLINE IS FITTED. WHEN A DRAGLINE IS FITTED THE PLUG ITEM 7 SHOULD BE SCREWED FULLY HOME INTO PORT 8 FOLLOWED BY THE ADAPTOR ITEM 8

400R HYDRAULIC CONTROL VALVE MHS

1	V2004605	VALVE CONTROL	1
2	100S03	SEAL BONDED	6
3	127S03	PLUG BLANKING	2
4	122S03	ADAPTOR M/M FROM PUMP	1
5	119S08	ADAPTOR M/M TO TANK	1
6	122S03	ADAPTOR M/M TO RAM	1
7	V2004607	SCREW SOCKET HEAD H.P.C.0 FIT INSIDE VALVE WHEN DRAGLINE FITTED	1
8	122S03	ADAPTOR M/M WHEN DRAGLINE FITTED	1
9	127S03	PLUG BLANKING WHEN NO DRAGLINE FITTED	1
20	8S03H	BOLT	2
21	267S05	WASHER FLAT	2
22	17S04	WASHER SPRING	2
23	7S03	NUT	2

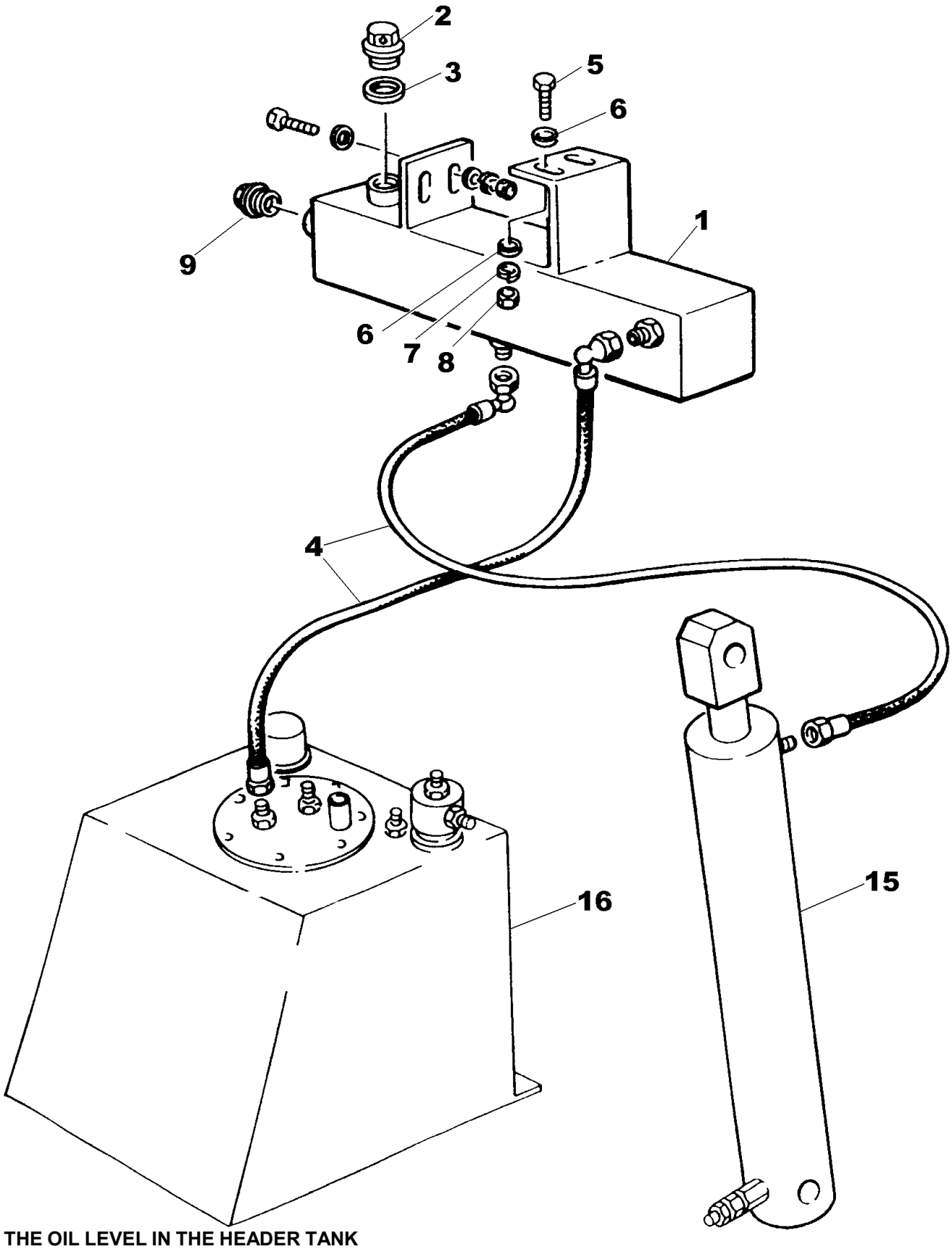
400R HYDRAULIC TANK,HOPPER RAM & PIPEWORK



400R HYDRAULIC TANK, HOPPER RAM & PIPEWORK

1	555257900	TANK HYDRAULIC	1
2	272150000	RAM	1
3	555204300	HOSE, BLEED VALVE TO RAM	1
4	555231000	HOSE, CONTROL VALVE TO BLEED VALVE	1
6	555258300	HOSE, TANK TO PUMP	1
7	555189500	HOSE, PUMP TO CONTROL VALVE	1
10	97S09	CLIP HOSE	2
11	73S03B	HOSE, CONTROL VALVE TO TANK TEE	1
20	365825000	PUMP- DIESEL DRIVEN	1
20	10539A02	PUMP- ELECTRIC MOTOR DRIVEN	1
21	66S01C	BOLT	4
22	41S03	WASHER SPRING	4
23	10S01	WASHER FLAT	4
25	100S06	SEAL BONDED	1
26	119S15	ADAPTOR MALE	1
27	100S04	SEAL BONDED-DISEL DRIVEN	1
27	100S06	SEAL BONDED-ELECTRIC MOTOR DRIVEN	1
28	119S08	ADAPTOR MALE- DIESEL DRIVEN	1
28	119S10	ADAPTOR MALE- ELECTRIC MOTOR DRIVEN	1
29	110S07G	FITTING NOZZLE	1
35	120S03	CAP BLANKING-NOT USED WHEN DRAGLINE IS FITTED	1
36	154S03	FITTING TEE-USED ONLY WHEN DRAGLINE IS FITTED	1
50	V2004605	CONTROL VALVE	
52	32S01C	HOSE-RAM RETURN TO TANK	1

400R HYDRAULIC HEADER TANK



TOP UP THE OIL LEVEL IN THE HEADER TANK WITH THE HOPPER RAISED AND THE RAM FULLY EXTENDED. LOWER THE HOPPER AND FILL THE TANK TO BRNG THE LEVEL UP TO THE MIDWAY POINT ON THE SIGHT GLASS. THE LEVEL WILL RISE AS THE HOPPER IS RAISED AND DROP AS THE HOPPER IS LOWERED. THE LEVEL SHOULD ONLY BE CHECKED WITH THE HOPPER LOWERED.

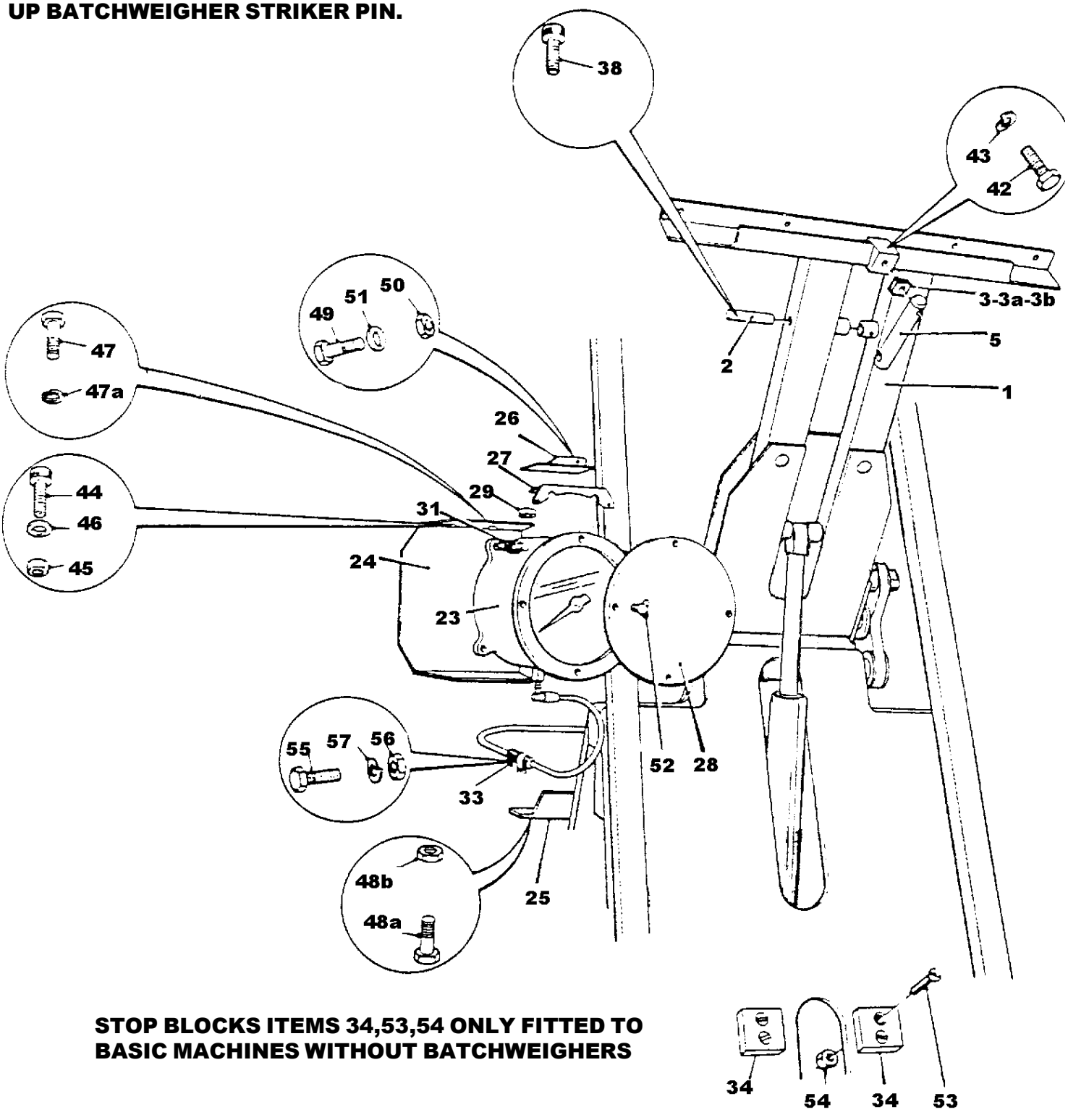
400R HEADER TANK

1	555288700	TANK HEADER	1
2	511100900	CAP FILLER/BREATHER	1
3	100S06	SEAL BONDED	1
4	32S01C	HOSE	2
5	11S03C	SCREW SET M8	4
6	267S05	WASHER FLAT M8	8
7	17S04	WASHER FLAT M8	4
8	7S03	NUT M8	4
9	V2005114	SIGHT GLASS	1
10	V2003100	DECAL HYDRAULIC OIL	1
11	V2005122	DECAL HYDRAULIC OIL LEVEL	1
15	272150000	RAM HYDRAULIC	1
16	555257900	TANK HYDRAULIC	1

400R HOPPER CRADLE AND BATCHWEIGHER

COAT ALL PINS AND THE BORES OF BUSHES AND WELDED BOSSES WITH COPPERSLIP ON ASSEMBLY.

FOLLOW INSTRUCTIONS IN TEXT AT BEGINNING OF THIS MANUAL WHEN SETTING UP BATCHWEIGHER STRIKER PIN.

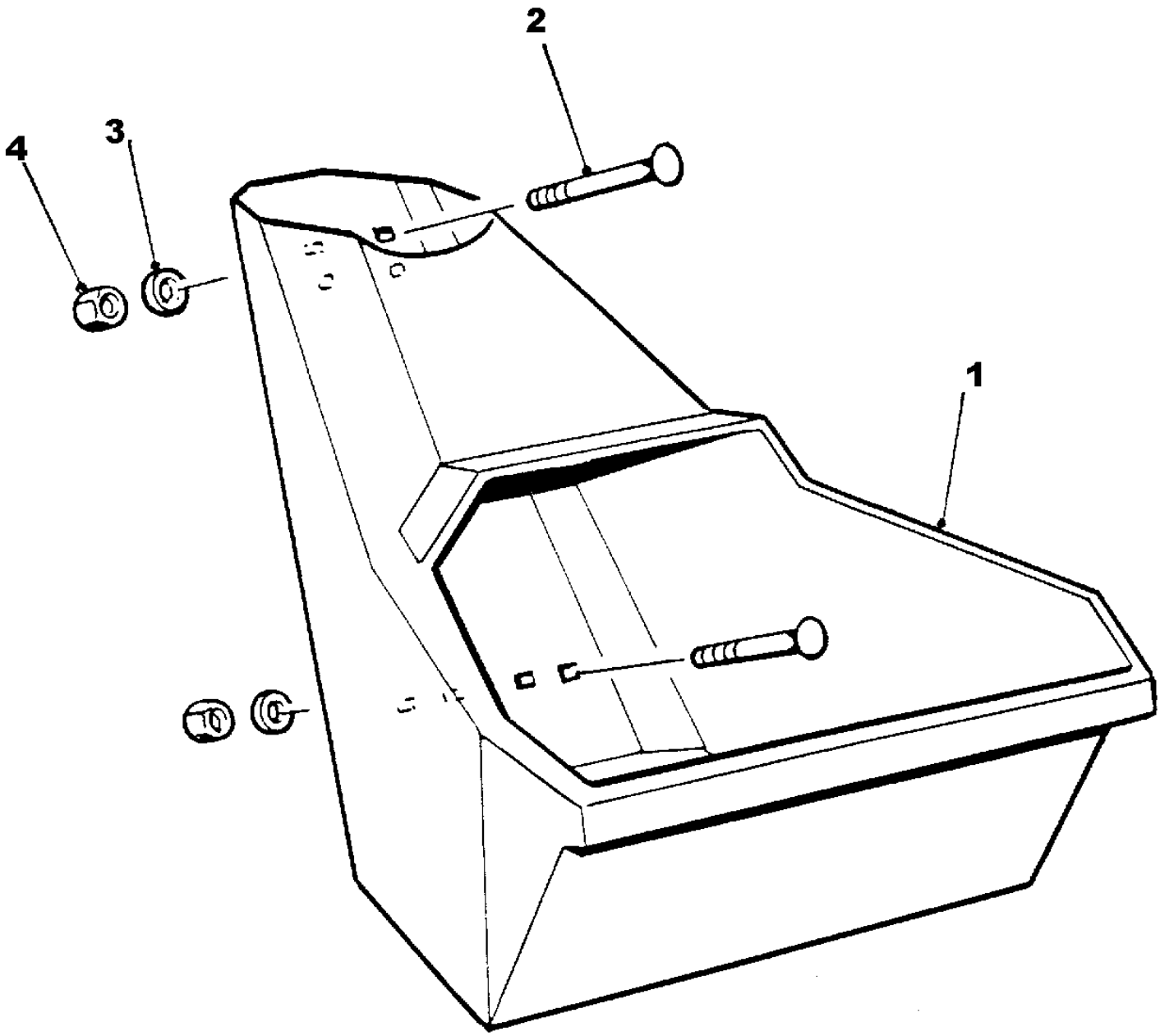


STOP BLOCKS ITEMS 34,53,54 ONLY FITTED TO BASIC MACHINES WITHOUT BATCHWEIGHERS

400R BATCHWEIGHER GAUGE AND HOPPER CRADLE

1	555269600	HOPPER CRADLE (ALL BUILDS)	1
2	555109300	PIN STRIKER SUPPORT	1
3	555109202	SHIM PACKER	1
3A	555109203	SHIM PACKER	1
3B	555109204	SHIM PACKER	1
5	555109100	STRIKER LOADCELL	1
23	555242414	LOADCELL & GAUGE	1
24	555192700	PLATE MOUNTING	1
25	555192800	BRACKET LOWER	1
26	555192900	BRACKET UPPER	1
27	555124900	PLATE MOUNT UPPER	1
28	555125000	COVER DIAL	1
29	555125100	SPACER	2
31	013203000	MOUNTING FLEXIBLE C/W NUTS	4
33	143200300	CLIP HOSE	1
34	555109600	STOP BLOCK CRADLE (WITHOUT BATCHWEIGHER)	2
38	195S03C2	SCREW GRUB	2
42	6S05E	SCREW SET	1
43	41S07	WASHER SPRING	1
44	28S03D	SCREW SET	2
44A	10S03	WASHER FLAT (NOT ILLUSTRATED)	2
45	9S03	NUT	2
46	41S05	WASHER SPRING	2
47	6S05C	SCREW SET	1
47A	87S05	NUT BINX	1
48A	6S05C	SCREW SET	1
48B	87S05	NUT BINX	1
49	6S03L	BOLT	1
50	9S03	NUT	1
51	41S05	WASHER SPRING	1
52	261S02M	THUMBSCREW	4
53	206S05C	SCREW COUNTERSUNK	4
54	192S05	NUT SELF LOCKING	4
55	16S05B	SCREW SL0TTED ROUND HEAD	2
55A	267S02	WASHER FLAT (NOT ILLUSTRATED)	2
56	7S09	NUT	2
57	17S10	WASHER SPRING	2
58	V2003111	CABLE TIE NYLON (NOT ILLUSTRATED)	2

400R HOPPER AND SAFETY CHAIN

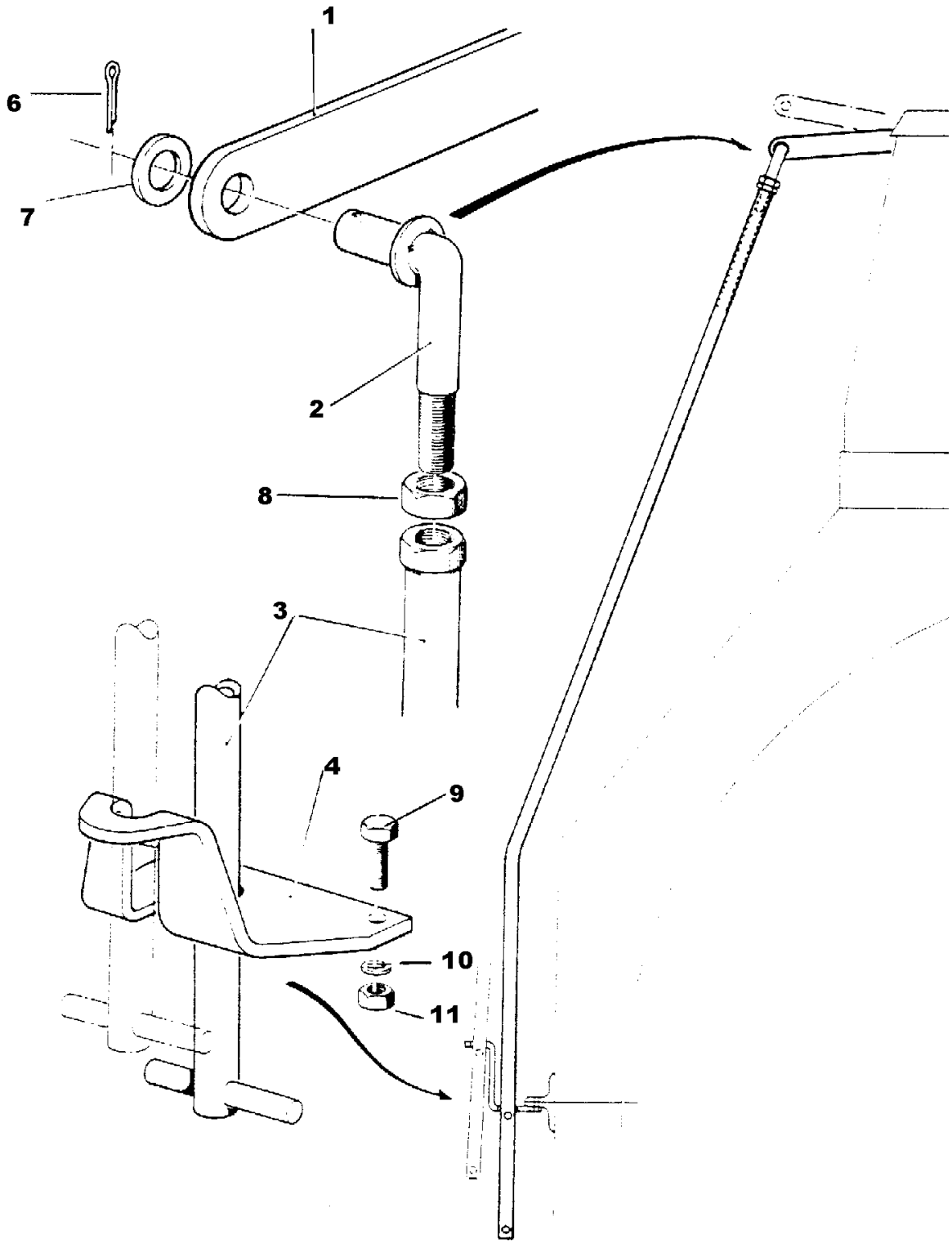


400R HOPPER AND SAFETY CHAIN

1	555265404	HOPPER	1
2	208S06J	SCREW COUNTERSUNK SOCKET	8
3	104S06	NUT	8
4	203S06	NUT LOCKING THIN	8
5	555269800	HOPPER SAFETY CHAIN	1
6	11S05D	SCREW SET	1
7	267S07	WASHER FLAT	1
8	61S05	NUT BINX	1

ITEMS 5, 6,7 & 8 ARE NOT ILLUSTRATED

400R WATER TANK CONTROLS

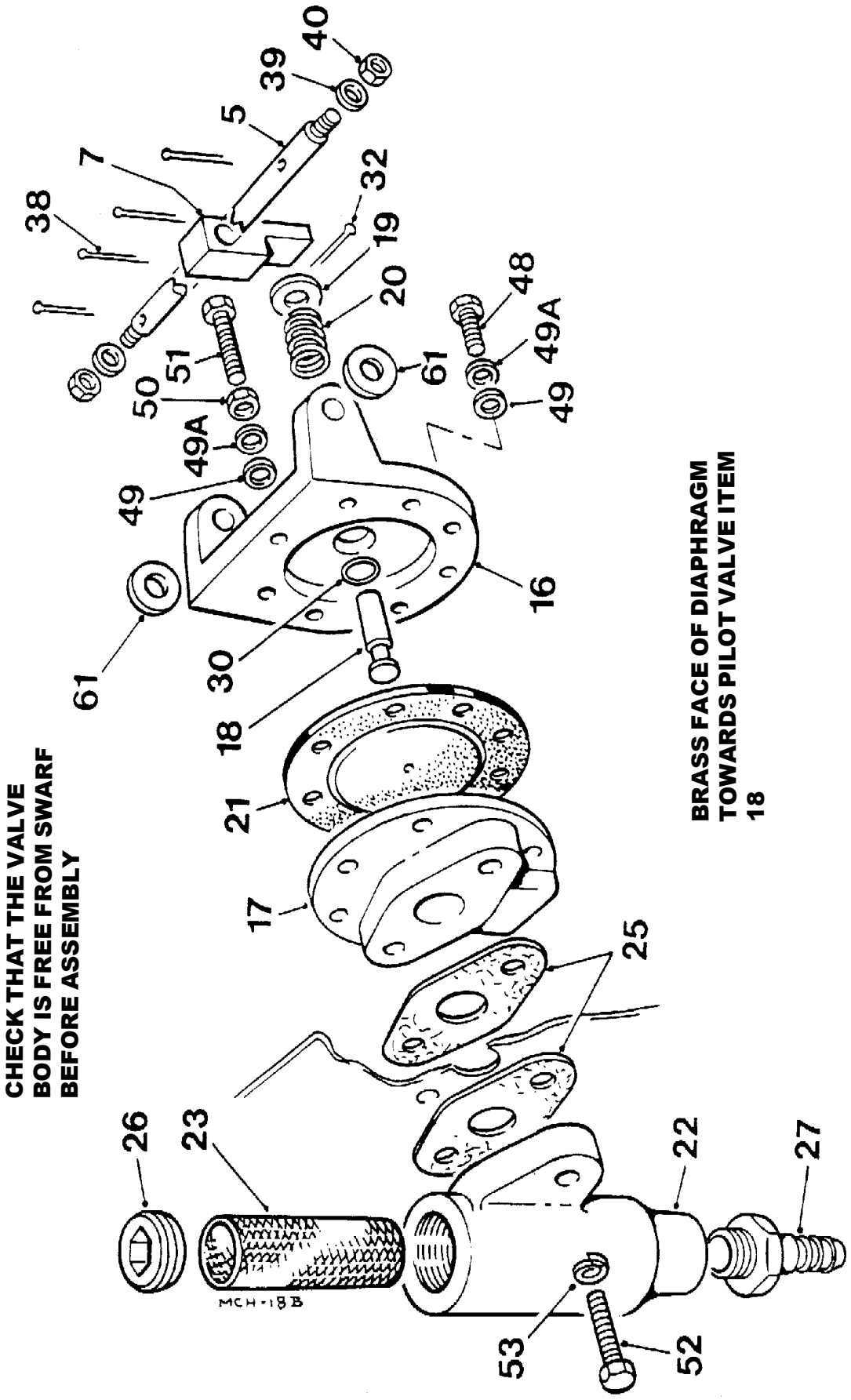


COAT THE THREADS ON ITEM 2 WITH COPPER SLIP ON ASSEMBLY

400R WATER TANK CONTROLS

1		OPERATING LEVER SEE WATER TANK	
2	555265100	COUPLING END	1
3	555255500	ROD OPERATING	1
4	555255700	BRACKET	1
6	44S03C	PIN SPLIT	1
7	267S06	WASHER FLAT	1
8	56S04	NUT THIN	1
9	6S03B	BOLT	2
10	10S03	WASHER FLAT	2
11	87S03	NUT BINX	2

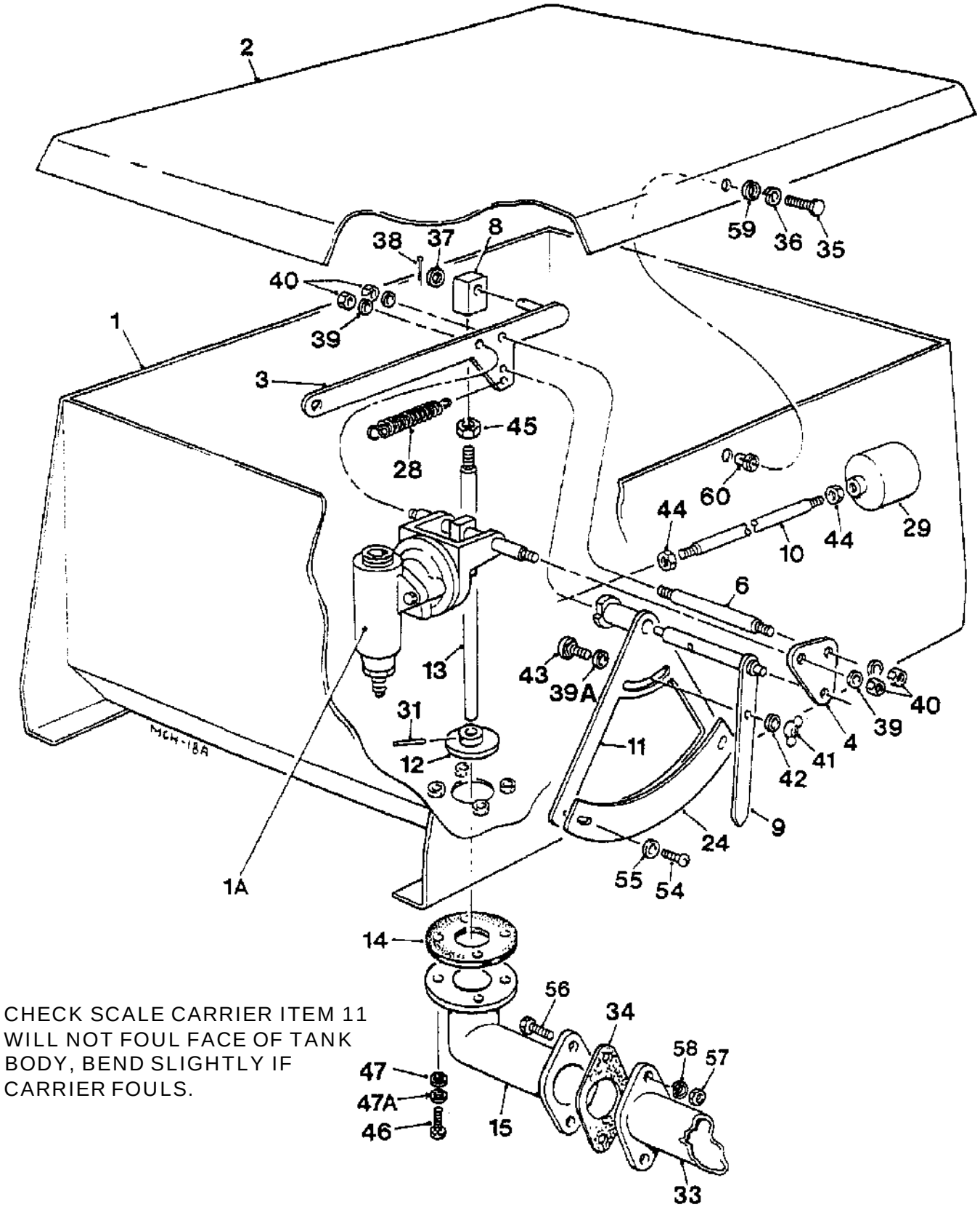
400R WATER TANK INLET VALVE



400R WATER INLET VALVE

5	555263000	PIN PIVOT	1
7	555262900	LEVER TRIP	1
16	555263500	COVER VALVE	1
17	555263600	BODY VALVE	1
18	555262700	VALVE PILOT	1
19	51311400	WASHER PILOT VALVE	1
20	513115200	SPRING PILOT VALVE	1
21	513122000	DIAPHRAGM	1
22	555198300	BODY STRAINER	1
23	555198400	ELEMENT STRAINER	1
25	555198800	GASKET	2
26	241708000	PLUG	1
27	130354000	CONNECTOR HOSE	1
30	49S39	SEAL 'O' RING	1
32	44S02B	PIN SPLIT	1
38	44S03C	PIN SPLIT	4
39	10S02	WASHER FLAT	2
40	61S03	NUT BINX	2
48	11S02C	SCREW SET	7
49	293S02	WASHER FIBRE	8
49A	267S04	WASHER FLAT	8
50	7S02	NUT	1
51	11S02F	SCREW SET	1
52	11S03C	SCREW SET	2
53	17S04	WASHER SPRING	2
61	267S07	WASHER FLAT	2

400R WATER TANK ASSEMBLY

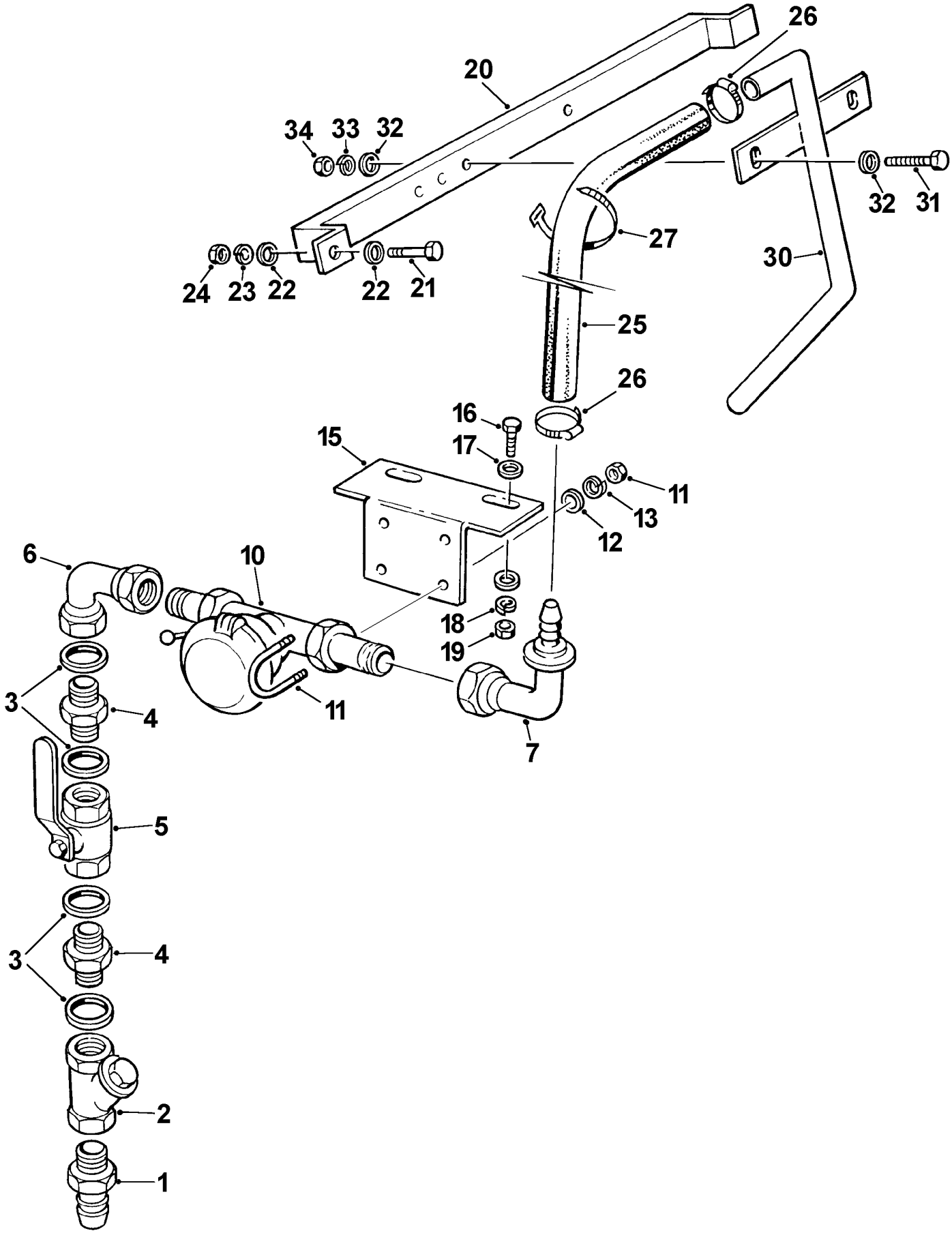


CHECK SCALE CARRIER ITEM 11 WILL NOT FOUL FACE OF TANK BODY, BEND SLIGHTLY IF CARRIER FOULS.

400R WATER TANK ASSEMBLY

1	555260700	TANK BODY	1
1A		VALVE WATER INLET	1
2	555261500	LID TANK	1
3	555263300	LEVER OPERATING	1
4	555263200	LINK OUTER	1
6	555263100	ROD SPACER	1
8	555262800	CONNECTOR VALVE ROD	1
9	555262100	INDICATOR	1
10	555262300	ARM FLOAT	1
11	555261900	CARRIER SCALE	1
12	555262400	VALVE DISCHARGE	1
13	555262500	ROD DISCHARGE VALVE	1
14	555262600	SEAT VALVE RUBBER	1
15	555261600	TANK OUTLET	1
24	555263400	SCALE GRADUATED	1
28	425434000	SPRING TENSION	1
29	220302000	FLOAT PLASTIC	1
31	353830426	PIN	1
33	555119300	PIPE WATER DISCHARGE	1
34	555119200	GASKET	1
35	11S02C	SCREW SET	1
36	17S03	WASHER SPRING	1
37	267S06	WASHER FLAT	1
38	44S03C	PIN SPLIT	1
39	10S02	WASHER FLAT	3
39A	267S07	WASHER FLAT	1
40	61S03	NUT BINX	4
41	177S04	NUT WING	1
42	17S04	WASHER SPRING	1
43	172S03A	BOLT ROUND HEAD CUP SQUARE	1
44	104S02	NUT	2
45	56S04	NUT	1
46	11S03D	SCREW SET	4
47	V601330	WASHER NYLON	4
47A	267S05	WASHER FLAT	4
54	70S04D	SCREW SLOTTED ROUND HEAD	2
55	267S03	WASHER FLAT	2
56	11S05F	SCREW SET	2
57	7S05	NUT	2
58	17S06	WASHER SPRING	2
59	267S04	WASHER FLAT	1
60	236S04	NUT BLIND	1

400R FLOWMETER



400R FLOWMETER

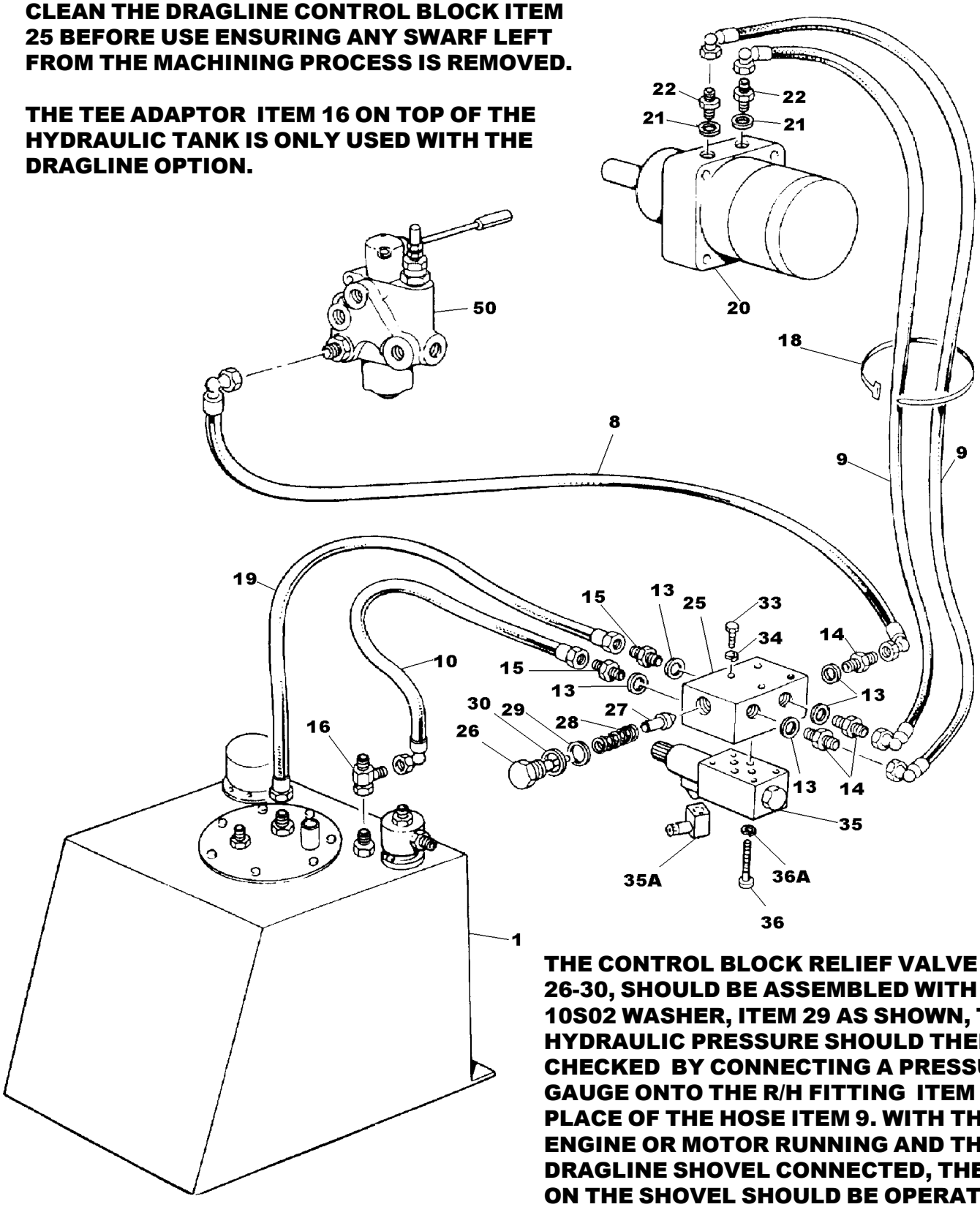
1	555176400	NOZZLE HOSE FITTING STRAIGHT	1
2	409255000	FILTER STRAINER	1
3	100S10	SEAL BONDED	6
4	122S09	ADAPTOR MALE/MALE	2
5	450151100	VALVE BALL	1
6	128S14	FITTING FEMALE, FEMALE 90'	1
7	129S07G	ADAPTOR NOZZLE 90' ELBOW	1
10	202325000	GAUGE FLOWMETER	1
11	153S09	CLAMP U BOLT	2
12	267S05	WASHER FLAT M8	4
13	17S04	WASHER SPRING M8	4
15	555176800	BRACKET FLOWMETER	1
16	6S03B	SCREW SET 3/8	2
17	10S03	WASHER FLAT 3/8	4
18	41S05	WASHER SPRING 3/8	2
19	87S03	NUT BINX 3/8	2
20	555174500	SUPPORT	1
21	6S03L	BOLT 3/8	2
22	10S03	WASHER FLAT 3/8	4
23	41S05	WASHER SPRING 3/8	2
24	9S03	NUT 3/8	2
25	37S04CB	HOSE 1.5" BORE	1
26	97S10	CLIP HOSE	3
27	V2003253	STRAP NYLON	1
30	555288800	PIPE WATER INLET	1
31	11S04C	SCREW SET M10	2
32	267S06	WASHER FLAT M10	4
33	17S05	WASHER SPRING M10	2
34	7S04	NUT M10	2

400R WINCH MOTOR & DRAGLINE CONTROL BLOCK

SEAL ALL HYDRAULIC FITTING AND ADAPTORS WITH LIQUID HYDRAULIC THREAD SEAL

CLEAN THE DRAGLINE CONTROL BLOCK ITEM 25 BEFORE USE ENSURING ANY SWARF LEFT FROM THE MACHINING PROCESS IS REMOVED.

THE TEE ADAPTOR ITEM 16 ON TOP OF THE HYDRAULIC TANK IS ONLY USED WITH THE DRAGLINE OPTION.

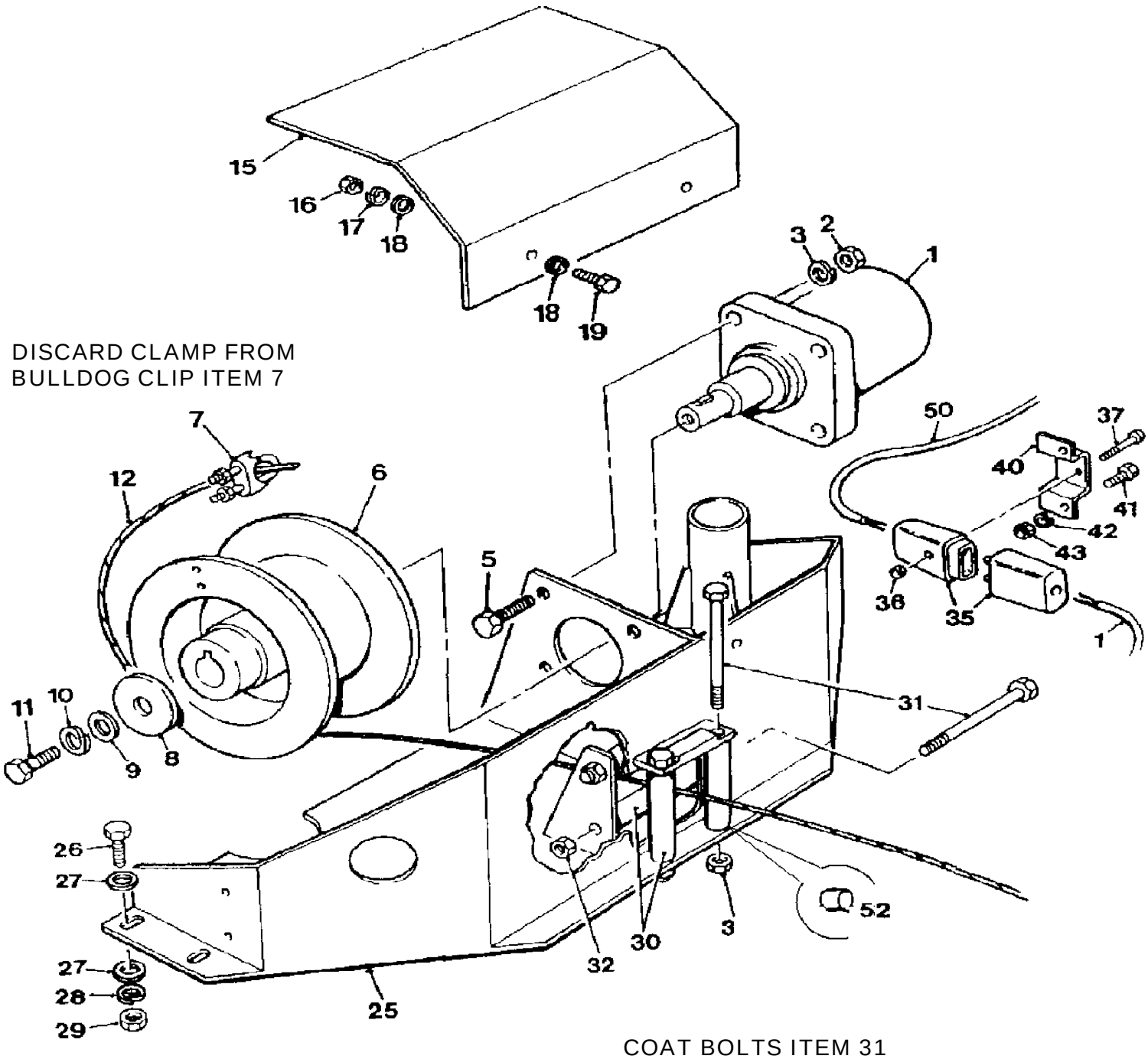


THE CONTROL BLOCK RELIEF VALVE ITEMS 26-30, SHOULD BE ASSEMBLED WITH ONE 10S02 WASHER, ITEM 29 AS SHOWN, THE HYDRAULIC PRESSURE SHOULD THEN BE CHECKED BY CONNECTING A PRESSURE GAUGE ONTO THE R/H FITTING ITEM 14 IN PLACE OF THE HOSE ITEM 9. WITH THE ENGINE OR MOTOR RUNNING AND THE DRAGLINE SHOVEL CONNECTED, THE SWITCH ON THE SHOVEL SHOULD BE OPERATED MOMENTARILY AND THE PRESSURE AT WHICH THE RELIEF VALVE 'BLOWS OFF' NOTED. THE PRESSURE IS CORRECT IF THE GAUGE READS BETWEEN 1000-1500 PSI, (69-103 BAR). ADD OR SUBJECT WASHERS ITEM 29 TO ADJUST.

400R DRAGLINE HYDRAULIC PIPEWORK AND VALVES

1	555257900	TANK HYDRAULIC	1
8	555268700	HOSE,CONTROL VALVE TO SOLENOID VALVE	1
9	63S02F	HOSE, SOLENOID VALVE TO WINCH MOTOR	2
10	73S03C	HOSE RETURN, SOLENOID TO TANK TEE	1
13	100S03	SEAL BONDED	5
14	122S03	ADAPTOR, MALE-MALE EQUAL	3
15	119S08	ADAPTOR, MALE-MALE UNEQUAL	2
16	154S03	FITTING TEE TANK FITTING	1
18	V2003253	TIE CABLE NYLON	2
19	35S03AK	HOSE RETURN, CONTROL BLOCK TO TANK	1
20	267117000	MOTOR HYDRAULIC (WHITE)	1
21	391111000	O' RING	2
22	126S09	ADAPTOR MALE MALE UNEQUAL	2
25	555287500	BLOCK, DRAGLINE CONTROL	1
26	555138200	GUIDE RELIEF VALVE	1
27	555138300	VALVE RELIEF	1
28	555556100	SPRING	1
29	100S04	SEAL BONDED	1
30	10S02	WASHER FLAT	A/R
33	11S03A	SCREW SET	4
34	17S04	WASHER SPRING	4
35	V2004676	VALVE SOLENOID	1
35A	V601234	PLUG-HIRSCHMANN	1
36	68S02E	SCREW SOCKET CAP HEAD 5MM DIAMETER	4
36A	17S02	WASHER SPRING	4
50	V2004605	VALVE CONTROL MHS-DINOIL	1

400R DRAGLINE WINCH AND MOUNTING BRACKET

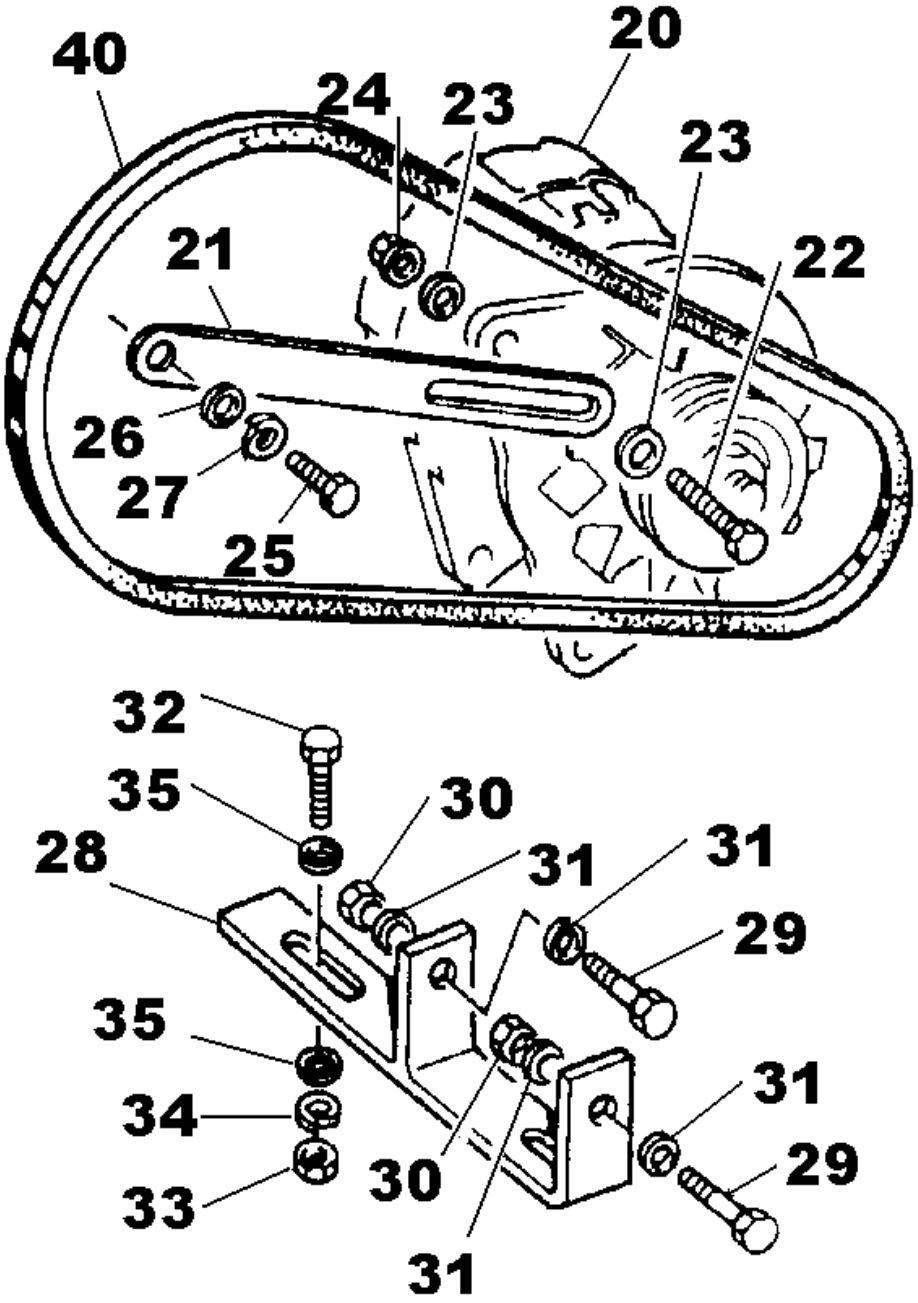


COAT BOLTS ITEM 31
WITH COPPERSLIP ON ASSEMBLY,
PACK BUSHES ITEM 52 AND ROLLERS
ITEM 30 WITH COPPERSLIP OR GREASE
ON ASSEMBLY

400R DRAGLINE BRACKET & WINCHMOTOR

1	267117000	MOTOR HYDRAULIC 'WHITE'	1
2	7S05	NUT	4
3	17S06	WASHER SPRING	4
5	11S05K	SCREW SET	4
6	513330100	PULLY-DRUM	1
7	132204000	CLIP BULLDOG	1
8	555266300	WASHER SPECIAL	1
9		NOT USED	1
10	41S09	WASHER SPRING	1
11	6S06H	SCREW SET	1
12	477502000	ROPE WIRE	1
15	555287800	COVER WINCH DRUM	1
16	7S04	NUT	2
17	17S05	WASHER SPRING	2
18	267S06	WASHER FLAT	4
19	11S04C	SCREW SET	2
25	555287700	BRACKET WINCH	1
26	11S05D	SCREW SET	4
27	267S07	WASHER FLAT	8
28	17S06	WASHER SPRING	4
29	7S05	NUT	4
30	555287900	ROLLER - WIRE ROPE	4
31	8S05U	BOLT - ROLLER	4
32	61S05	NUT BINX	4
35	205304600	PLUG AND SOCKET	1
36	86S07	NUT NYLOC	1
37	82S07F	SCREW ROUND HEAD	1
40	555253800	CLAMP - SOCKET	1
41	11S01A	SCREW SET	2
42	17S02	WASHER SPRING	2
43	7S01	NUT	2
50	144734000	CABLE - TO SOLENOID	1
51	144734000	CABLE - TO SHOVEL	1
52	V2005386	BUSH-WINCH ROLLERS	8

400R DRAGLINE ALTERNATOR AND FIXINGS



SECURE ALTERNATOR FAN AND PULLEY BEFORE INSTALLING ALTERNATOR, ADJUST DRIVE BELT TENSION SO THAT BELT DEFLECTS NO MORE THAN 12MM MIDWAY BETWEEN PULLIES.
ADJUSTER ITEM 21 IS ATTACHED TO THE REVERSING GEARBOX.

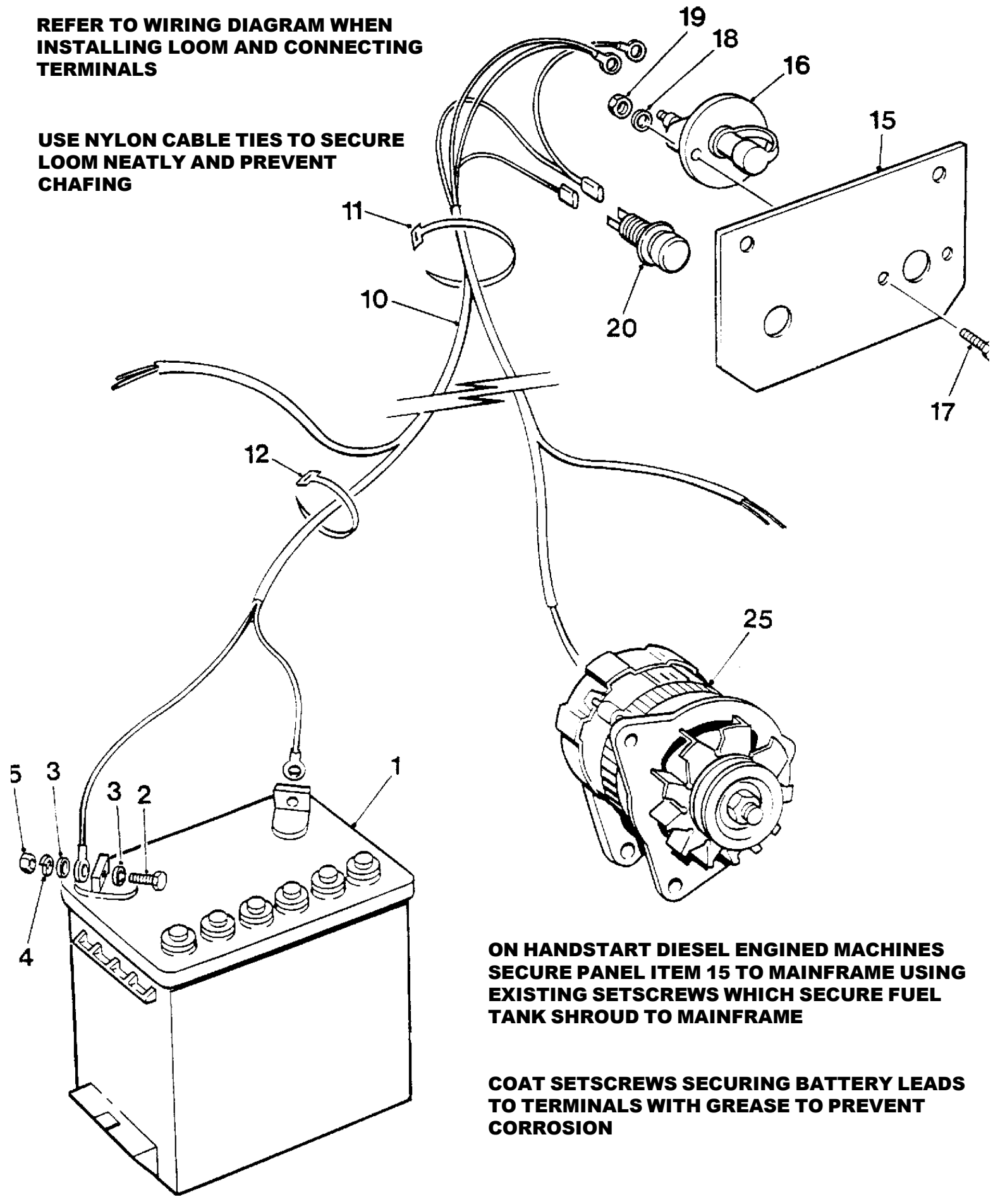
400R DRAGLINE ALTERNATOR & FITTINGS

20	V2004793	ALTERNATOR	1
21	513347400	ADJUSTER	1
22	11S03C	SCREW SET	1
23	267S05	WASHER FLAT	2
24	61S03	NUT BINX	1
25	66S03A	SCREW SET	1
26	10S03	WASHER FLAT	1
27	41S05	WASHER SPRING	1
28	555288300	BRACKET ALTERNATOR	1
29	8S03C	BOLT	2
30	61S03	NUT BINX	2
31	267S05	WASHER FLAT	2
32	11S04C	SCREW SET	2
33	7S04	NUT	2
34	17S05	WASHER SPRING	2
35	267S06	WASHER FLAT	4
40	397227000	VEE BELT	1

400R DRAGLINE ALTERNATOR WIRING & PANEL

REFER TO WIRING DIAGRAM WHEN INSTALLING LOOM AND CONNECTING TERMINALS

USE NYLON CABLE TIES TO SECURE LOOM NEATLY AND PREVENT CHAFING



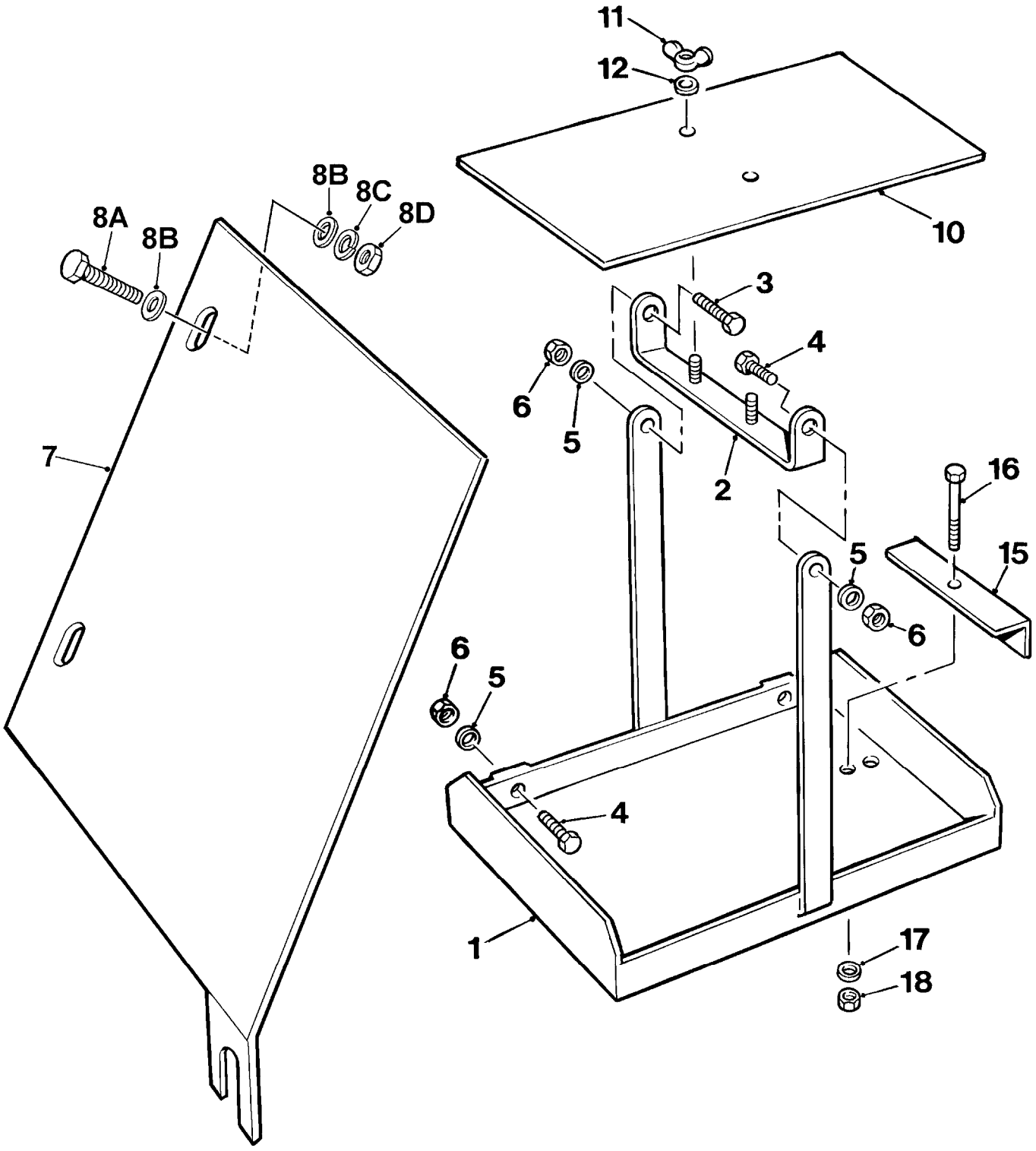
ON HANDSTART DIESEL ENGINED MACHINES SECURE PANEL ITEM 15 TO MAINFRAME USING EXISTING SETSCREWS WHICH SECURE FUEL TANK SHROUD TO MAINFRAME

COAT SETSCREWS SECURING BATTERY LEADS TO TERMINALS WITH GREASE TO PREVENT CORROSION

400R DRAGLINE ALTERNATOR WIRING & PANEL

1	109S10	BATTERY	1
2	11S02B	SCREW SET	2
3	267S04	WASHER FLAT	4
4	17S03	WASHER SPRING	2
5	7S02	NUT	2
10	555288400	LOOM WIRING	1
11	V2003253	CABLE TIE NYLON	6
12	V2003111	CABLE TIE NYLON	6
15	555288100	PANEL	1
16	V2004794	SWITCH BATTERY ISOLATOR	1
17	11S02B	SCREW SET	2
18	267S04	WASHER FLAT	2
19	61S02	NUT BINX	2
20	V2000326	LIGHT WARNING	1
25	V2004793	ALTERNATOR	1
26	V2004795	DECAL ISOLATOR SWITCH	1
27	V2004796	DECAL ALTERNATOR	1
28	16S05B	SCREW SLOTTED RD HEAD (NOT ILLUSTRATED)	11
29	143200900	CLIP P NYLON (NOT ILLUSTRATED)	11
30	17S10	WASHER SPRING (NOT ILLUSTRATED)	11
31	267S02	WASHER FLAT (NOT ILLUSTRATED)	11
32	7S09	NUT (NOT ILLUSTRATED)	11

400R DRAGLINE BATTERY TRAY & GUARD



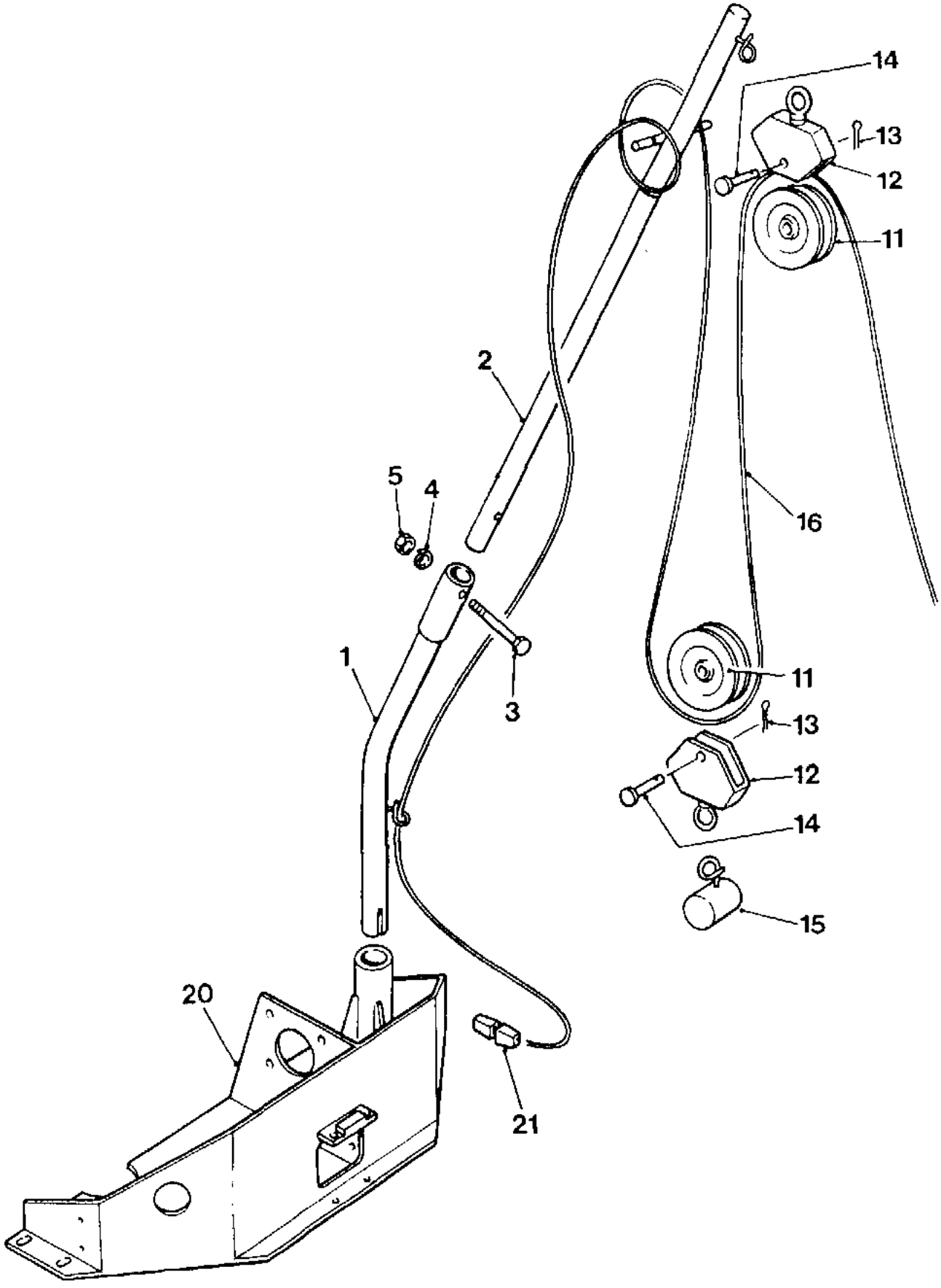
EARLY MACHINES REQUIRE THE MAINFRAME DRILLING TO THE LEFT HAND SIDE OF THE ENGINE BED SO THAT THE BATTERY TRAY CAN BE ATTACHED. THE MAINFRAME OF LATER MACHINES IS PREDRILLED DURING MANUFACTURE.

ALTERNATIVELY THE TRAY CAN BE WELDED IN POSITION.

400R DRAGLINE BATTERY TRAY

1	30080A03	TRAY BATTERY	1
2	30080A0303	BAR COVER	1
3	11S04E	SCREW SET	1
4	11S04C	SCREW SET	3
5	267S06	WASHER FLAT	4
6	61S04	NUT BINX	4
7	555290500	GUARD BATTERY	1
8	11S03C	SCREW SET	2
8A	267S05	WASHER FLAT	4
8B	17S04	SPRING WASHER	2
8C	7S03	NUT	2
10	10742A05	COVER BATTERY	1
11	177S03	NUT WING	2
12	267S04	WASHER FLAT	2
15	555288200	CLAMP BATTERY	2
16	8S02F	BOLT	2
17	267S04	WASHER FLAT	4
18	61S02	NUT BINX	2
19	V2004235	DECAL NEGATIVE EARTH	1

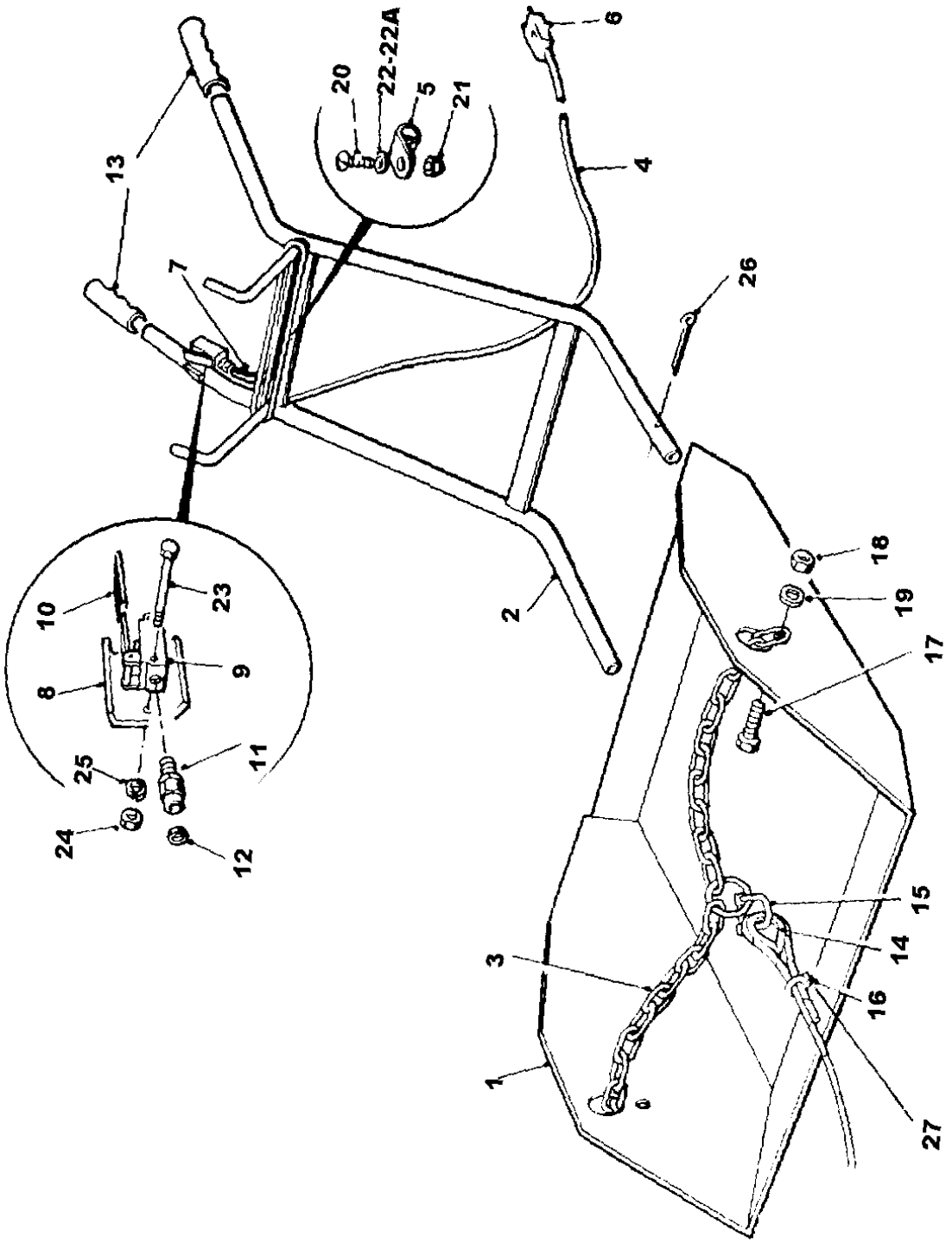
400R DRAGLINE CABLE MAST AND PULLIES



400R DRAGLINE MAST CABLE AND PULLIES

1	555121500	MAST LOWER	1
2	515134400	MAST UPPER	1
3	8S05L	BOLT	1
4	17S06	WASHER SPRING	1
5	7S05	NUT	1
11	555208100	PULLEY	2
12	555208400	BLOCK PULLEY	2
13	44S03C	PIN SPLIT	2
14	555208300	PIN PULLEY	2
15	555204800	WEIGHT	1
16	144734000	CABLE ELECTRIC 2 CORE	1
20	555287700	BRACKET DRAGLINE WINCH	1
21	205304600	PLUG & SOCKET	1

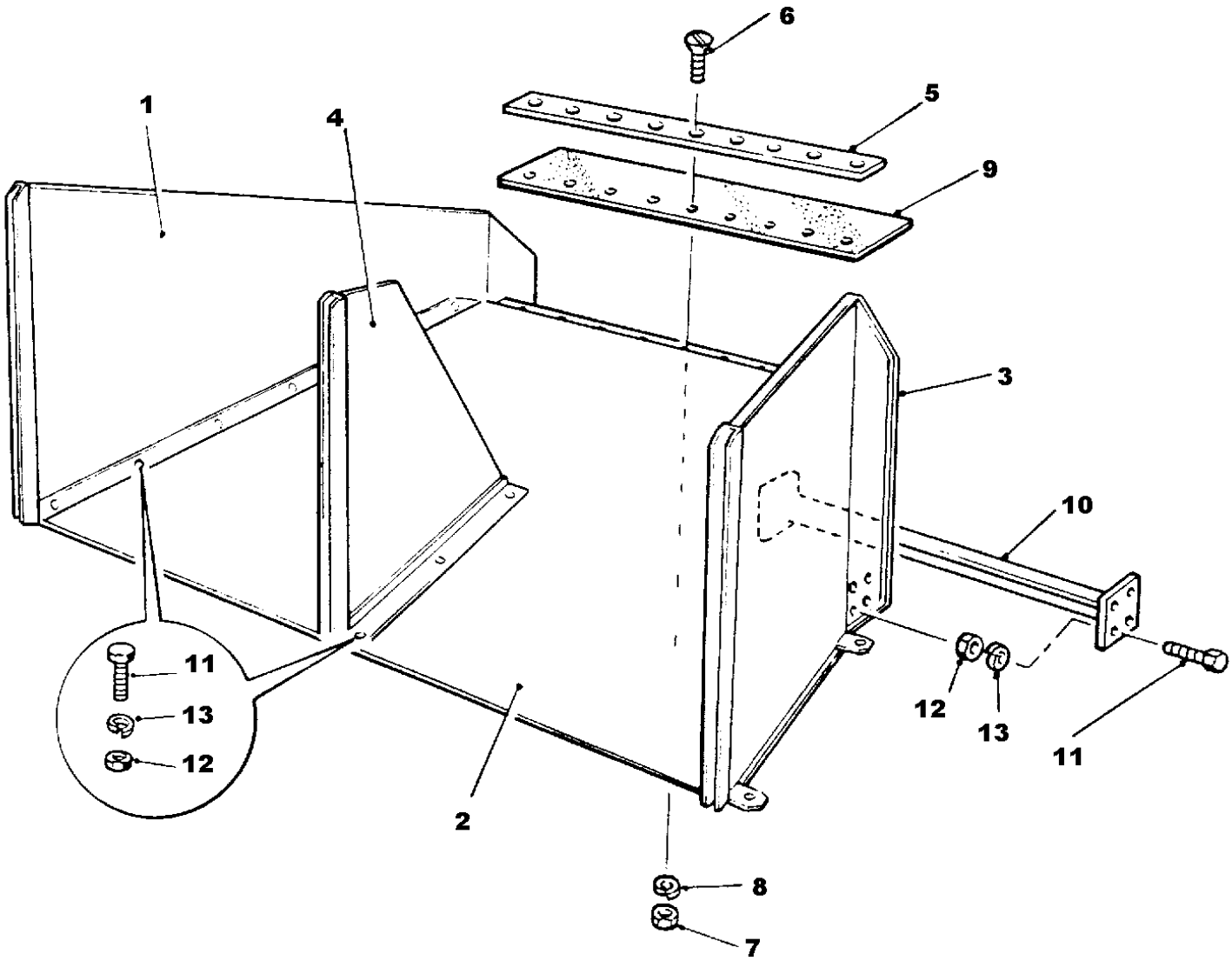
400R DRAGLINE SHOVEL ASSEMBLY

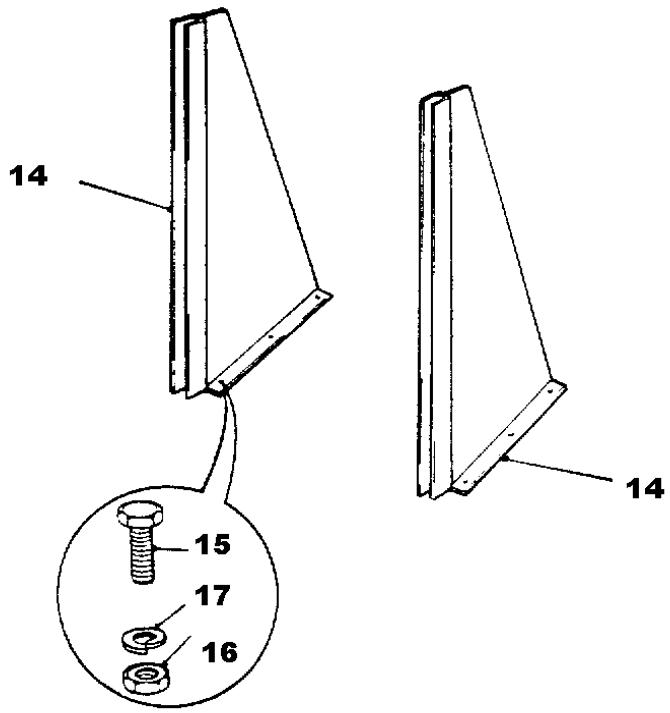


400R DRAGLINE SHOVEL

1	555210400	SHOVEL BODY	1
2	555209100	SHOVEL HANDLE	1
3	135905000-(15 LINKS)	CHAIN & RING ASSY	1
4	144734000	CABLE 2 CORE	1
5	143200300	CLIP CABLE	1
6	205304600	PLUG	1
7	369200000	TUBE 300MM/12" LONG	1
8	555214800	CLAMP SWITCH	1
9	208561000	SWITCH	1
10	208143000	SLEEVE PVC 55 MM LONG	1
11	250166010	GLAND CABLE	1
13	264705000	GRIP HANDLE	2
14	443105010	THIMBLE ROPE WIRE	1
15	412606000	SHACKLE D + PIN	1
16	132204000	CLIP BULLDOG	2
17	11S05D	SCREW SET	2
18	59S04	NUT NYLOC	2
19	267S07	WASHER FLAT	2
20	16S05B	SCREW SLOTTED PAN HEAD	1
21	7S09	NUT	1
22	267S02	WASHER FLAT	2
22A	17S10	WASHER SPRING (NOT ILLUSTRATED)	1
23	8S01H	BOLT SWITCH	2
24	7S01	NUT	2
25	17S02	WASHER SPRING	2
26	44S17K	PIN SPLIT	2
27	17S03	WASHER SPRING (NOT ILLUSTRATED)	2

400R 2 AND 3 COMPARTMENT FEED APRON

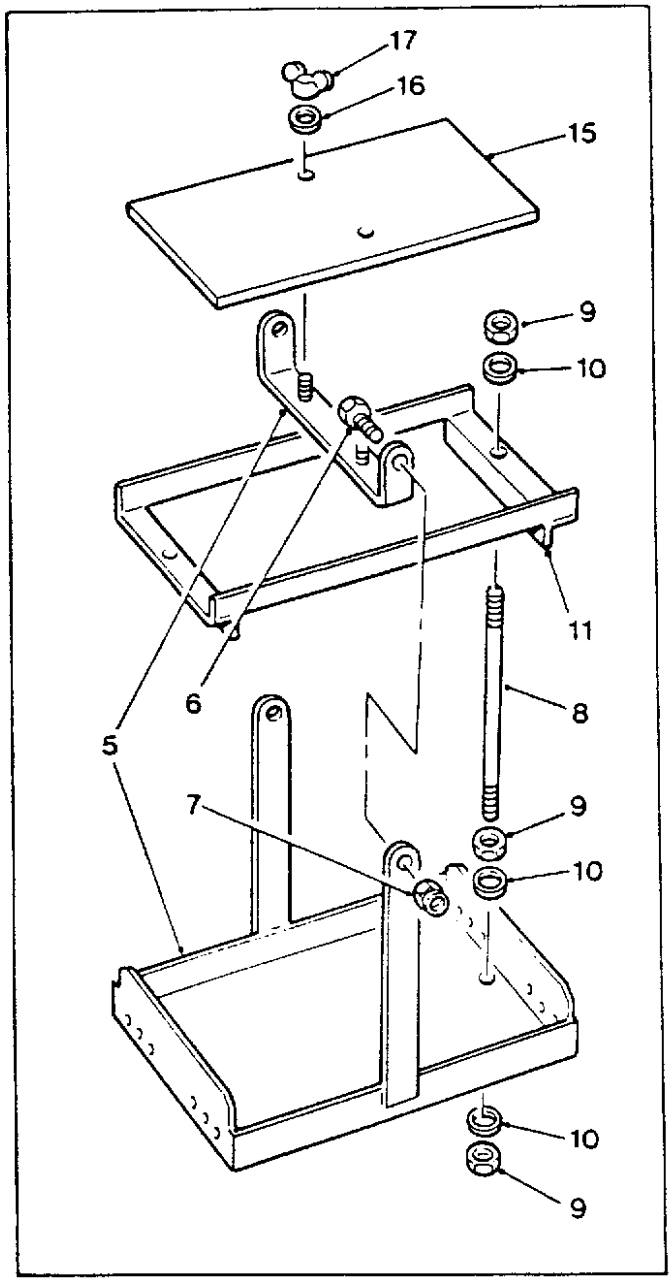


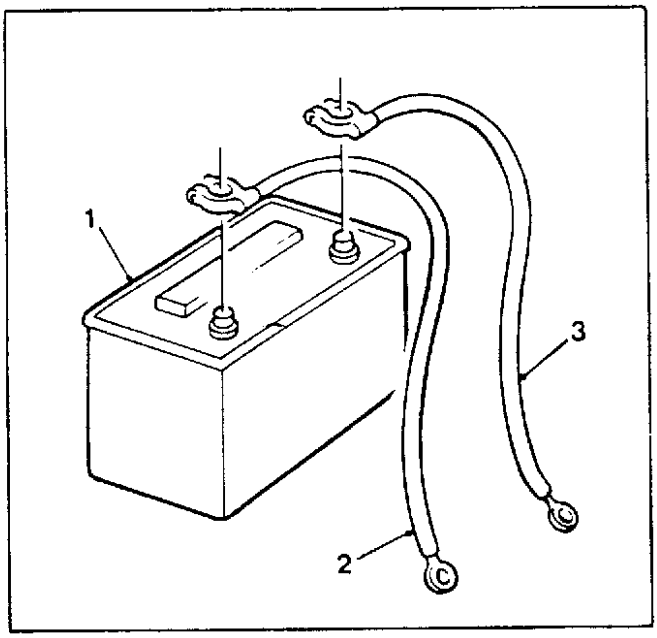


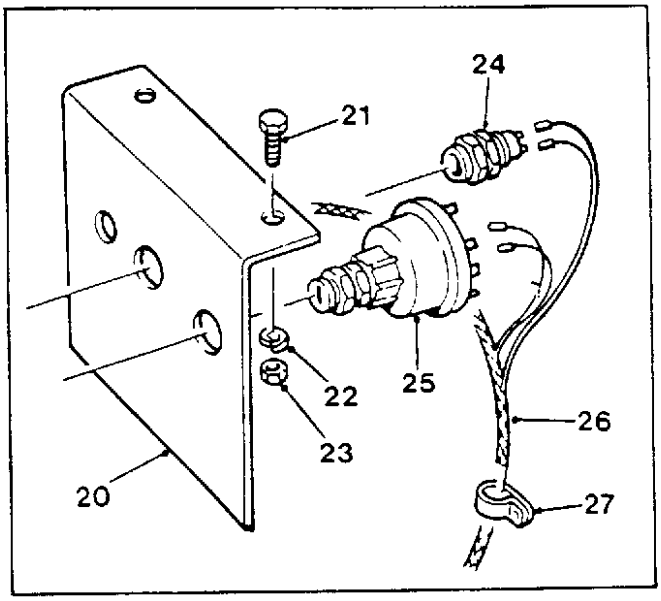
400R 2 AND 3 COMPARTMENT FEED APRONS

1	555196302	PLATE SIDE LH	1
2	555196301	PLATE BOTTOM	1
3	555196303	PLATE SIDE RH	1
4	555196307	PARTITION CENTRE (2 COMPARTMENT)	1
5	555196315	STRAP RUBBER RETAINER	1
6	208S03H	SCREW COUNTERSUNK SOCKET HEAD	10
7	104S03	NUT	10
8	41S05	WASHER SPRING	10
9	394413001	RUBBER FLAP	1
10	555196308	CENTRE SUPPORT	1
11	28S05E	SCREW SET	30
12	9S04	NUT	30
13	41S07	WASHER SPRING	30
		30 NUTS WASHERS AND SETSCREWS REQUIRED WITH 2 COMPARTMENT FEED APRON	
14	555104800	PARTITION CENTRE (3 COMPARTMENT)	1PR
15	28S05E	SCREW SET	32
16	9S04	NUT	32
17	41S07	WASHER SPRING	32
		32 NUTS WASHERS AND SETSCREWS REQUIRED WITH 3 COMPARTMENT FEED APRON	

400R ELECTRIC START BATTERY, LEADS, TRAY & SWITCH







WELD BATTERY TRAY TO SIDE OF MAINFRAME ADJACENT TO THE ENGINE BED, MAKING SURE THAT THE BATTERY LEADS WILL REACH BETWEEN THE BATTERY AND STARTER MOTOR.

THE INSTRUMENT PANEL IS SECURED TO THE UNDERSIDE OF THE FUEL TANK SHROUD WHICH IS DRILLED TO ACOMODATE THE PANEL, USING THE PANEL AS A PATTERN

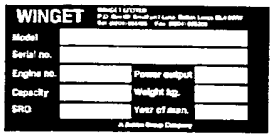
FOLLOW THE WIRING DIAGRAMS WHEN WIRING UP THE SWITCH, LIGHT, CHARGE WINDINGS AND REGULATOR.

400R ELECTRIC START BATTERY AND LEADS

1	109S08	BATTERY	1
2	10989A06	CABLE BATTERY POSITIVE	1
3	10990402	CABLE BATTERY NEGATIVE	1
5	30080A03	CARRIER BATTERY	1
6	11S04D	SCREW SET	2
7	59S03	NUT LOCK	2
8	40SA17	ROD TIE	2
9	9S01	NUT	6
10	267S04	WASHER FLAT	6
11	10559A01	CLAMP BATTERY	1
15	10742A05	COVER BATTERY	1
16	267S04	WASHER FLAT	2
17	177S03	NUT WING	2
18	V2004235	DECAL 'NEGATIVE EARTH'	1
18A	V2004204	INSULATOR POSITIVE NOT ILLUSTRATED	1
20	20313A05	PANEL INSTRUMENT	1
21	28S03D	SCREW SET	2
22	41S05	WASHER SPRING	2
23	9S03	NUT	2
24	366-07228	LIGHT WARNING	1
25	V2003561	SWITCH IGNITION	1
	ITEM 24-25	SUPPLIED WITH ENGINE	
26	30231A11	LOOM WIRING	1
27	V2003377	CLIP LOOM	1

400R DECALS AND LOGO'S

1



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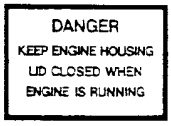

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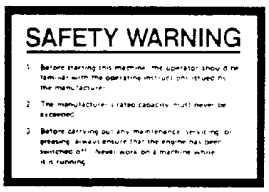

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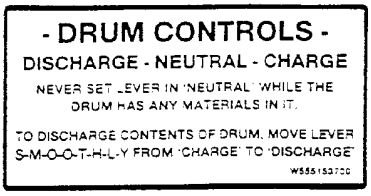
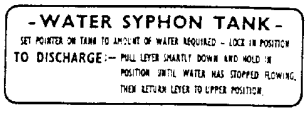

- DRUM CONTROLS -
DISCHARGE - NEUTRAL - CHARGE
NEVER SET LEVER IN 'NEUTRAL' WHILE THE DRUM HAS ANY MATERIALS IN IT.
TO DISCHARGE CONTENTS OF DRUM, MOVE LEVER S-M-O-O-T-H-L-Y FROM 'CHARGE' TO 'DISCHARGE'

7



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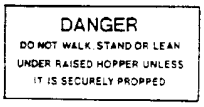

9

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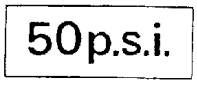
13

WARNING
DO NOT TAMPER WITH THE PIPE CONNECTION ON THE LOAD CELL OR GAUGE.
THIS IS A SEALED CIRCUIT AND MUST NOT BE INTERFERED WITH.

14

15

16



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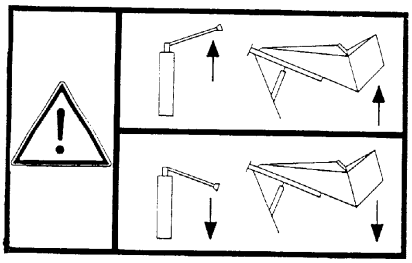
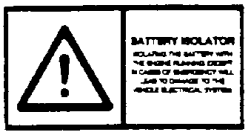


400R DECALS AND LOGO'S

1	V2003037	PLATE SERIAL NUMBER	1
2	504600900	DECAL 'ENGINE HOUSING'	2
3	504694600	DECAL 'SAFETY WARNING'	2
4	V2003039	DECAL 'WINGET'	3
5	V2003126	DECAL '400R'	2
6	555153700	DECAL 'DRUM CONTROLS'	1
7	555153500	DECAL 'WATER TANK'	1
8	555184900	DECAL 'DANGER HOPPER'	2
9	V2004137	DECAL 'EAR PROTECTION'	2
10	V2003038	VINYL STRIPES 2 COLOUR	4
11	V2003101	DECAL 'DIESEL FUEL'	1
12	V2003100	DECAL 'HYDRAULIC OIL'	2
13	515175000	PLATE LOADCELL	1
14	V2003665	DECAL 'SLING POINT'	2
15	V2003598	DECAL 'BRITISH MADE'	1
16	10166A02	DECAL 'TYRE PRESSURE'	4
17	V2004259	DECAL 'HOPPER CONTROLS'	1
18	V2004227	DECAL 'BATTERY ISOLATOR'	1
19	V2004229	DECAL 'OPERATORS HANDBOOK'	1
20	V2004235	DECAL 'NEGATIVE EARTH'	1
21	V2004282	DECAL 'HOT SURFACE'	1
22	V2004281	DECAL 'ENTRAPMENT'	1
23	V2004288	DECAL 'STARTING HANDLE'	1
24	V2004289	DECAL 'HANDS CLEAR'	2
25	V2004302	DECAL 'ENGINE STOP'	1
26	V2004307	DECAL 'ELECTRICAL HAZARD'	3
27	V2004223	DECAL 'CE MARK'	1
28	V2004796	DECAL ALTERNATOR	1
29	V2004744	DECAL 'EYE PROTECTION'	2
30	V2004795	DECAL 'ISOLATOR SWITCH'	1
31	V2005122	DECAL 'CHECK HYDRAULIC OIL'	1
32	V2005312	DECAL 'NOISE 98 LPA'	2
33	V2005319	DECAL 'NOISE 115 LWA'	2
34	V2005315	DECAL 'WATER PRESSURE'	1

400R DECALS AND LOGO'S

18



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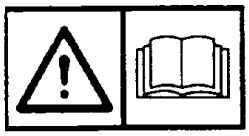

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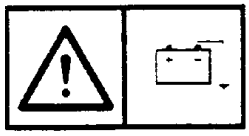

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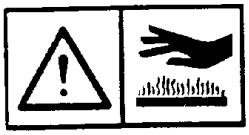

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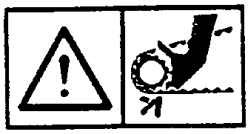

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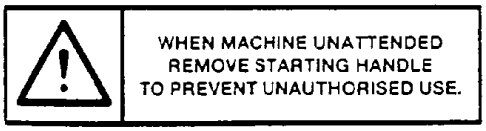

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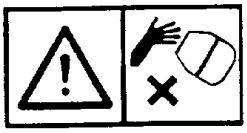

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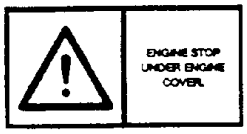

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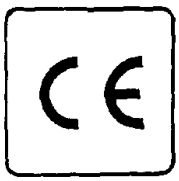

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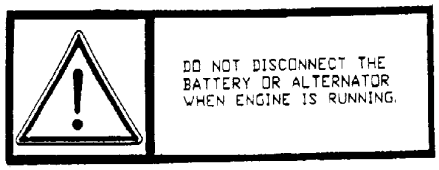

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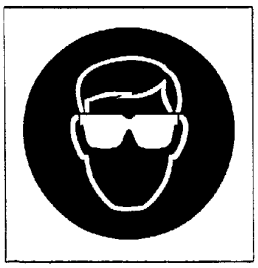

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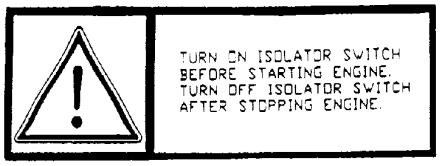

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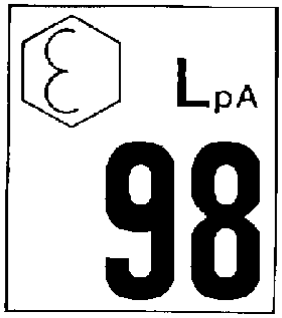

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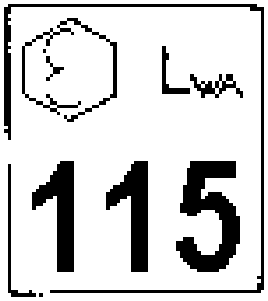

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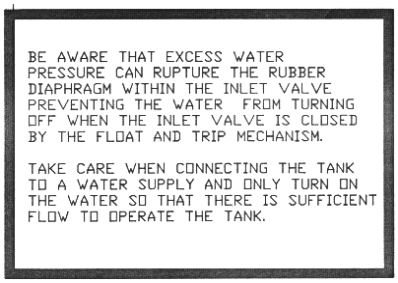

BE AWARE THAT EXCESS WATER
PRESSURE CAN RUPTURE THE RUBBER
DIAPHRAGM WITHIN THE INLET VALVE
PREVENTING THE WATER FROM TURNING
OFF WHEN THE INLET VALVE IS CLOSED
BY THE FLOAT AND TRIP MECHANISM.
TAKE CARE WHEN CONNECTING THE TANK
TO A WATER SUPPLY AND ONLY TURN ON
THE WATER SO THAT THERE IS SUFFICIENT
FLOW TO OPERATE THE TANK.

WORKSHOP MANUAL

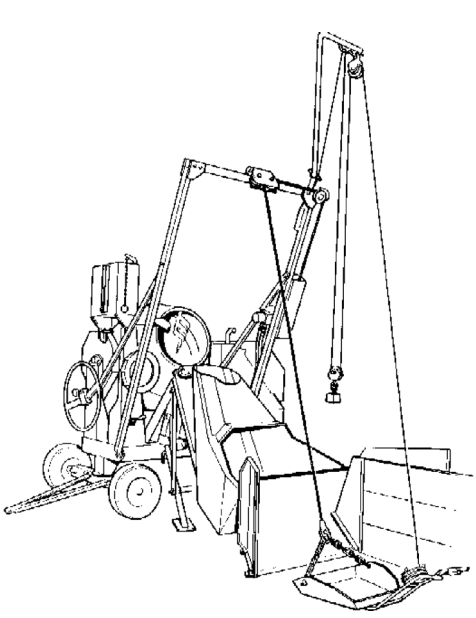
300R & 400R

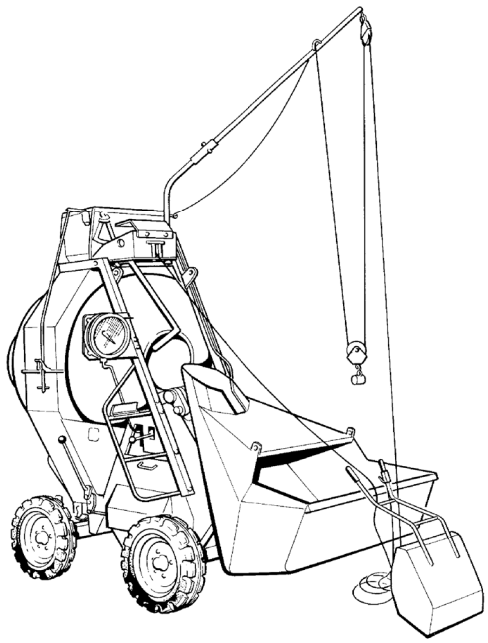
SECTION 11

BATCHWEIGHER MAINTENANCE INSTRUCTIONS

WINGET

MAINTENANCE INSTRUCTIONS





HYDRAULIC WEIGHING UNITS

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INTRODUCTION

This manual covers the Batchweigher Loadcell and Guage installed into 200TM Mechanically Fed Mixers and 300R, 400R and 500R Reversing Drum Mixers.

Winget Limited do not recommend that attempts are made in the field to rectify faulty loadcells and gauges as the special tools and equipment required are unlikely to be available. It is recommended that faulty units are returned to Winget Limited for repair or overhaul. However in recognition of the fact that this advice is not always practicable Winget Limited have released this manual subject to the disclaimer below:-

The contents of this manual although correct at the time of publication, may be subject to alteration by the manufacturers without notice and Winget Limited can accept no responsibility for any errors or omissions contained within the following pages. Nor can we accept any liability whatsoever arising from the use of this manual howsoever caused.

Winget Limited operate a ploicy of continuous product development, therefore some illustrations or text within this publication may differ from your machine.

HYDRAULIC WEIGHING UNIT

(British Provisional Patent 15633/59)

"WINGET LIMITED" sealed unit for bulk weighing comprises a load sensing cell coupled hydraulically to an indicating dial gauge of very robust design. The application of a weight to the load cell causes the displacement of a diaphragm of special design and consequently the build up of a hydraulic pressure. This pressure, which is directly proportional to the applied weight, is then measured by the pressure sensitive element in the dial gauge and the pointer is rotated an amount proportiona to the applied weight. The dial of the gauge, which can be either 12" or 18" in diameter, is calibrated in the desired weight units and thus the pointer will indicate immediately the value of the weight which has been applied to the load cell. The sweep of the pointer on the dial is 295° in order that divisions as large as possible may be used.

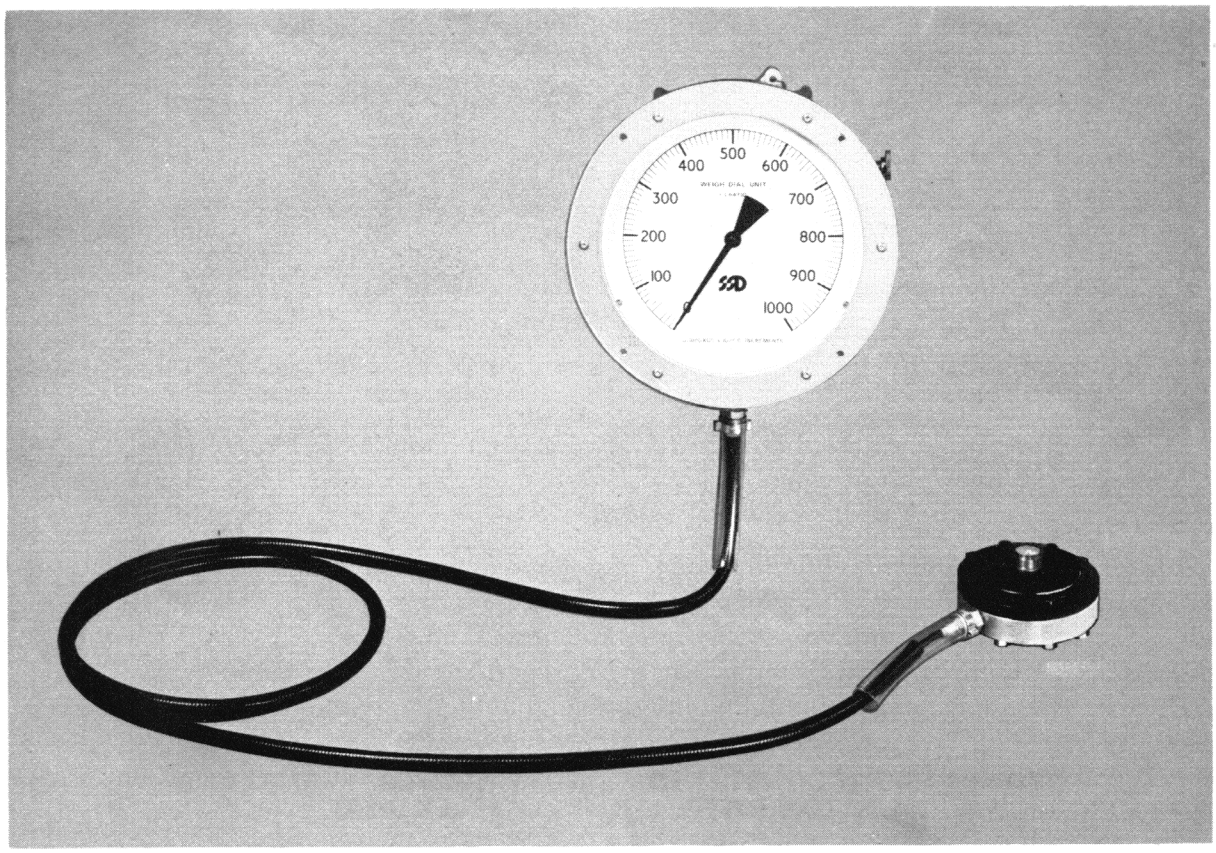
Being completely self contained, with no exposed moving parts, the **"WINGET LIMITED"** HYDRAULIC WEIGHING UNIT offers considerable advantages over conventional types of weighing systems which may employ beams, knife edges, etc. The units are thus particularly valuable for use on concrete mixing or batching plants where dirt and grit may affect the operation of a conventional weighing system.

The hydraulic connection between the cell and the indicating dial gauge is made with a flexible armoured capillary tube which will withstand rough handling and the end fittings have been specially designed to prevent unauthorised tampering with the sealed hydraulic system.

The load indicating dial may be placed remotely from the load cell or at any height above or below it without the calibration being affected, and the very sensitive gauge mechanism is provided with an adjustable pointer dampener should excessive vibration be present in the structure on which it is mounted.

The indicating dial mechanism is provided with an externally operated adjustment so that the pointer may be "zeroed" as desired to compensate for changes in skip or container weights due to the adherence of the material being weighed. Standard "clip-on" pointers, are fitted to the rim of the indicating dial where mixed loads are to be weighed in the same container. These can be supplied in different colours to represent the different materials being loaded.

The accuracy of the hydraulic weighing unit is of the order of + or -3 % of its maximum capacity, *i.e.* the accuracy of indication of weight on a system capable of weighing, say 1000 lbs., will be within + or -30 lbs.



HEAVY DUTY HYDRAULIC WEIGHING UNITS

GENERAL INFORMATION, INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS

1. Introduction

These units consist of a dial indicator connected to a load cell by a flexible capillary tube. Upon the application of a load to a load cell a hydraulic pressure is generated which is transmitted to the indicator through the capillary tube.

The indicator is calibrated in units of nett weight (lbs or kgs) or in the case of liquids - gallons or litres.

WARNING

The system is sealed at the Factory after filling with hydraulic fluid by a special high vacuum process. Any attempt to disconnect the capillary tube, at either end, or to dismantle the load cell will immediately render the whole unit inoperative.

In the event of fluid leakage or damage to the capillary tube, the indicator will give a false reading and the whole unit must be returned for repair to the works or an agent having the necessary fluid filling and calibrating facilities.

Never allow the load cell or the gauge to be suspended by the capillary tube.

Note:

The weighing unit should always be mounted with anti-vibration pads onto the machine structure and we would advise that the machine motor is similarly mounted to give steady pointer reading.

2. Specification

a) Heavy duty pattern, weatherproof indicators for surface mounting.

This indicator is extremely robust, fully weatherproof and capable of withstanding excessive overload conditions. The movement is fitted with a friction type damping device which can be adjusted to reduce pointer oscillation caused by excessive vibrations. Adjustable coloured pointers are provided on the front flange for use as required. A pointer zero re-set device is fitted and this is operated by a knob projecting from the side of the case. 12" (300mm) and 18" (450mm) sizes are available and the indicators can be provided with electrical contacts.

Note:

Although the indicator will withstand extreme overloads, it must be emphasised that the load cell must be protected from excessive shock loads (for example, a skip unladen or laden must not be allowed to drop on to the load cell without restriction).

3. Load Cell Specification

The load cell consists of a central plattern bonded with natural rubber to the walls of the cell body. Standard indicators are fitted with 3 sq. in., 5 sq. in. or 10 sq. in. load cells, depending upon the loads to be applied.

Load cells of greater capacity are also available.

The standard load cells are suitable for the following conditions:-

3 sq. in. Maximum occasional load 1500 lb. (680 Kg)
Maximum continuous load 900 lb. (408 Kg)

5 sq. in. Maximum occasional load 2500 lb. (1134 Kg)
Maximum continuous load 1500 lb. (680 Kg)

10 sq. in. Maximum occasional load 5000 lb. (2268 Kg)
Maximum continuous load 3000 lb. (1361 Kg)

4. Capillary Tube Specification

Flexible nylon tube, terylene braided with an outer nylon coating, protected by a terylene reinforced PVC armouring.

Bursting pressure 11,000 p.s.i. (773.40 Kg/cm²) at an ambient temperature of 20°C.

Operating temperature -40°C to 100°C continuous, or up to 120°C intermittent.

5. Installation

a) Application of Load

The load cell has a central domed button to which the load must be applied by means of a flat, hardened steel plate. A suitable plate must therefore be rigidly fixed to the bottom of the skip or whatever container carries the material to be weighed, and arranged to be at right angles to the load cell centre line when in the weighing position.

Note:

1. For some applications, for example, hanging loads, a 'V' button and ball is fitted as an alternative to the domed button.
2. Weighing units can be supplied for systems employing lever action, offset, unbalanced loading and for other applications where the ratio of the weight of the container and contents are not on a 1:1 ratio to the load on the load cell. In such applications, full details should be provided.

Shock and Overload

The load must be applied to load cell with the minimum amount of shock. The unit will accept an accidental overload (this varies with the calibration) but repeated dropping of an empty skip on to the load cell will eventually rupture the rubber bonding. Any arrestor gear to prevent shock must be arranged so that this does not bear any of the load during the actual weighing process. Buffers or cushions interposed between the skip and the load cell domed button are usually ineffective due to the relatively small movement of the load cell diaphragm.

Note:

The weight of the empty skip or container must not exceed one-third of the total scale reading of the indicator required.

b) Load Cell

The load cell must be positioned to meet all the above requirements of load application and securely bolted to a suitably rigid support which will accept the maximum load with a minimum of deflection. The location should be free from excessive heat and from danger of contamination by mineral oils which adversely affect the natural rubber diaphragm bonding.

Note:

Additional protection has now been provided by the application of a Neoprene coating.

c) Dial Indicator and Capillary

Before mounting, check that the capillary can be conveniently routed, protected from abrasion, excessive heat, etc., and secured avoiding tension, compression, sharp bends or kinks. Excess length should be coiled (min. radius 6" (150mm) and secured to prevent vibration which would otherwise cause pointer oscillation. Securely fix the dial indicator in a vertical position, with anti-vibration pads if necessary. Ensure that the zero adjustment-knob is accessible for tone adjustment. Under no load conditions the pointer will be in a position anti-clockwise from zero on the scale. This is normal and the pointer will approach zero when the weight of the empty skip is applied to the load cell.

6. Operation

The weighing action is entirely automatic giving a direct reading on the dial instantaneously and continuously. The operator should ensure that the skip or container is settling correctly on to the load cell dome, with the smallest possible shock, and check that the pointer reads zero with the empty container at rest.

Zero or tare adjustment

Compensation for any change in weight of the skip is quickly and simply acheived by turning the zero re-set knob in a clockwise or anti-clockwise direction as necessary until the pointer rests at zero.

7. Maintenance

a) Lubrication

DO NOT attempt to lubricate any part of this system. The movement bearings of the indicator are pre-lubricated and the load cell diaphragm will be attacked by any form of mineral oil.

b) Routine checks

Make regular checks of:-

i) Security of load cell and indicator mounting.
ii) Security, protection and condition of capillary.
iii) Hardened steel plate and load cell domed button.
iv) Correct operation of any arrestor gear.
v) Correct application of load to cell.

c) Oil Contamination

In the event of contamination of the load cell by diesel fuel or mineral oil, petrol or paraffin, as quickly as possible remove the drip shield (when fitted) and scrub the top of the load cell with warm water and ordinary soap (not detergents or solvents).

d) Calibration Check

The calibration can be checked by placing known weights in the skip. In the event of error, the calibration can be adjusted but this requires the service of a skilled mechanic. (See Appendix A).

e) Pointer oscillation

Excessive pointer oscillation caused by erratic filling of the skip or container or by external vibrating sources can be damped by means of an adjustable mechanism. inside the dial indicator. (Fitted to Heavy Duty Units only).

Note:

If this adjustment entails removal of the indicator from its mounting take care that the capillary is not in any way strained. Do not disconnect the capillary. (See Appendix B).

HYDRAULIC WEIGHING UNITS

APPENDIX A

POINTER ADJUSTMENT

The instructions set out below are for the adjustment of the pointer only, if the readings are overweight or underweight.

1. Remove backplate.
2. Before adjusting the pointer, release the blue locknut on the pointer oscillation damper and turn the blue hexagon headed screw in an anti-clockwise direction as this will release any restriction on the pointer.
3. Set pointer to read zero on dial by means of adjusting knob on side of case after applying equivalent skip weight to load cell.
4. Take various readings on the gauge by applying known weights and thus giving some indication as to whether the gauge is reading over or underweight.
5. If the gauge reads overweight throughout the complete scale of the dial, slacken off the link screw (painted green) and turn the toggle screw (painted red) in an anti-clockwise direction. Only slight adjustments of the toggle screw should be made. Note: ½ turn of the toggle screw makes approximately 1" difference in linear travel of the pointer (tip).
6. Re-tighten link screw (painted green).
7. If the gauge reads underweight throughout the complete scale of the dial, slacken off link screw (painted green) and turn the toggle screw (painted red) in a clockwise direction, this being the reverse procedure to Note (5).
8. Re-tighten link screw (painted green).
9. Before re-checking calibration it is most important that the gauge pointer should be set at zero, otherwise a false impression of the errors may result.
10. To re-set oscillating damper, see Oscillating Damper Instructions.
11. Re-fit backplate.

APPENDIX B

POINTER OSCILLATING DAMPER ADJUSTMENT

The instructions set out below are for the adjustment of the pointer oscillating damper only.

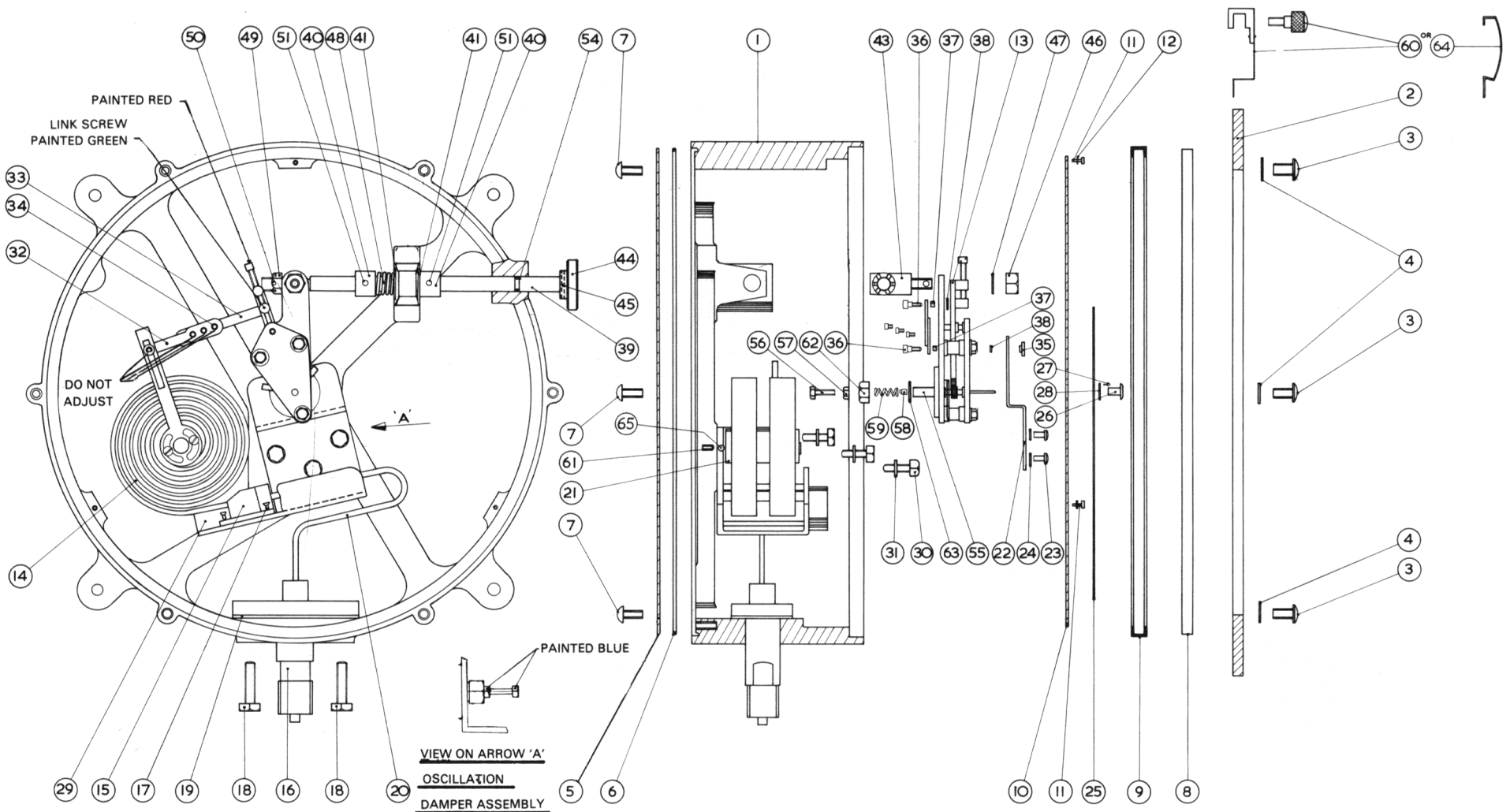
The oscillating damper will be found on the rear side of the movement comprising a small blue hexagon screw with a blue locknut.

With machine running and skip in the "ready to load" position:-

1. Remove backplate.
2. Release the blue locknut.
3. Turn the hexagon headed screw in a clockwise direction until pointer oscillation is reduced to a minimum, at the same time avoid excessive tightening of hexagon headed screw.
4. Add known weights to ensure that application of damper has not affected weight readings.

5. If the readings have been affected this will indicate that the hexagon headed screw has been tightened down too far and it should be released slightly until the readings become accurate.
6. Remove the weights and check that pointer returns to zero.
7. Re-tighten blue locknut.
8. Re-fit backplate.

These instructions are for the adjustment of the pointer and oscillating damper only and on no account should any other form of adjustment take place or screws interferred with as this may result in making the whole unit unserviceable.



HYDRAULIC WEIGHING UNIT

Item No.	Description	Qty	Part No.	Code	DRG. No.
1	Case	1	WDG12-MK.2-1-1		A1-3545
2	Rim	1	WDG 12-2-1		G/1987
3	Rim Screws	6	WDG 12-3-6		None
4	Rim Screw Washers	6			None
5	Backplate	1	WDG 12-4-1		A3-1699
6	Backplate Gasket	1	WDG 12-5-1		A4-3599
7	Backplate Screws	6	WDG 12-6-6		None
8	Window	1	WDG 12-7-1		A4-3599
9	Window Gasket	1	WDG 12-8-1		G/1981/Item 21
10	Dial	1	WDG 12-9-1		A4-3599
11	Dial Screw	3	WDG 12-10-3		None
12	Dial Screw Washers	3			None
13	Movement Assembly	1	WDG 12/18-11-1		G/3241/C
14	Tube	2	WDG 12/18-12-2		A4-3598
15	Tube Block	1	WDG 12/18-13-1		G/1980/Item 11
16	Connection Block	1	WDG 12/18-14-1		G/1980/Item 12
17	Tube Block Screws	4			None
18	Connection Block Bolts	4	WDG 12/18-15-4		None
19	Connection Block Gasket	1	WDG 12/18-16-1		G1988/Item 26
20	Connecting Tube	1	WDG 12/18-17-1		G1988/Item 29
21	Endbit	1	WDG 12/18-18-1		G1980/Item 13
22	Endbit Lever	1	WDG 12/18-19-1		G1738/Item 1
23	Endbit Screws	2	WDG 12/18-20-2		None
24	Endbit Washers	2			None
25	Pointer	1	WDG 12-21-1		G/16/460
26	Pointer Bush	1	WDG 12-22-1		G3696 B
27	Pointer Rivet	1			None
28	Pointer Washer	1	WDG 12/18-23-1		G/16/460
29	Mounting Frame	1	WDG 12/18-24-1		A2/3530
30	Mounting Frame Screws	3	WDG 12/18-25-3		None
31	Mounting Washers	3	WDG 12/18-26-3		None

Item No.	Description	Qty	Part No	Code	DRG No.
32	Link	1	WDG 12/18-27-1		G3446B
33	Slotted Link	1	WDG 12/18-28-1		4G-5169
34	Link Adjustment Screws	3	WDG 12/18-29-3		None
35	Link Nut	1	WDG 12/18-30-1		G3592B
36	Link Screw	2	WDG 12/18-31-2		G3591B
37	Link Screw Brush	2	WDG 12/18-32-2		G3595B
38	Link Washer	2	WDG 12/18-33-2		G3593B
39	Adjustment Rod	1	WDG 12-34-1		3G-5166
40	Adjustment Rod Bush	2			None
41	Adjustment Rod Thrust Washer				
43	Adjustment Pillar	1	WDG 12/18-37-1		G1981/Item 18
44	Adjustment Knob	1	WDG 12/18-38-1		G1979/Item 10
45	Adjustment Knob Pin	1			None
46	Adjustment Pillar Nut	1	WDG 12/18-39-1		None
47	Adjustment Pillar Washer	1	WDG 12/18-40-1		None
48	Adjustment Rod Spring	1	WDG 12/18-41-1		4G5170
49	Adjustment Rod Castle Nut	1	WDG 12/18-42-1		None
50	Adjustment Rod. Nut Cotter Pin.	1	WDG 12/18-43-1		None
51	Adjustment Rod. Bush Cotter Pin	2	WDG/12/18-44-2		4G-5170
54	Spindle 'O' Ring	1	WDG 12/18-47-1		None
55	Swivel Plate	1	WDG 12/18-50-1		G2091/Item 1
56	Damper Adjustment Screw	1	WDG 12/18-51-1		G2091/Item 2
57	Lock Nut	1	WDG 12/18-52-1		G2091/Item 3
58	Friction Pad	1	WDG 12/18-53-1		G2091/Item 4
59	Friction Pad Spring	1	WDG 12/18-54-1		G2091/Item 5
60	Screw-on-Pointer	3	WDG 12-55-3-8		G/9/160 & G1910 Item 8
61	End Bit Bleeder Screw	1	WDG 12/18-57-1		G1980 Item 13a
62	Swivel Plate Nut	1			None
63	Swivel Plate Washer	1			None
64	Clip-on Pointer	3			G/1988 Item 31
65	Steel Ball Bleed Seal	1			G1980 Item 13b

PARTS LIST

WORKSHOP MANUAL

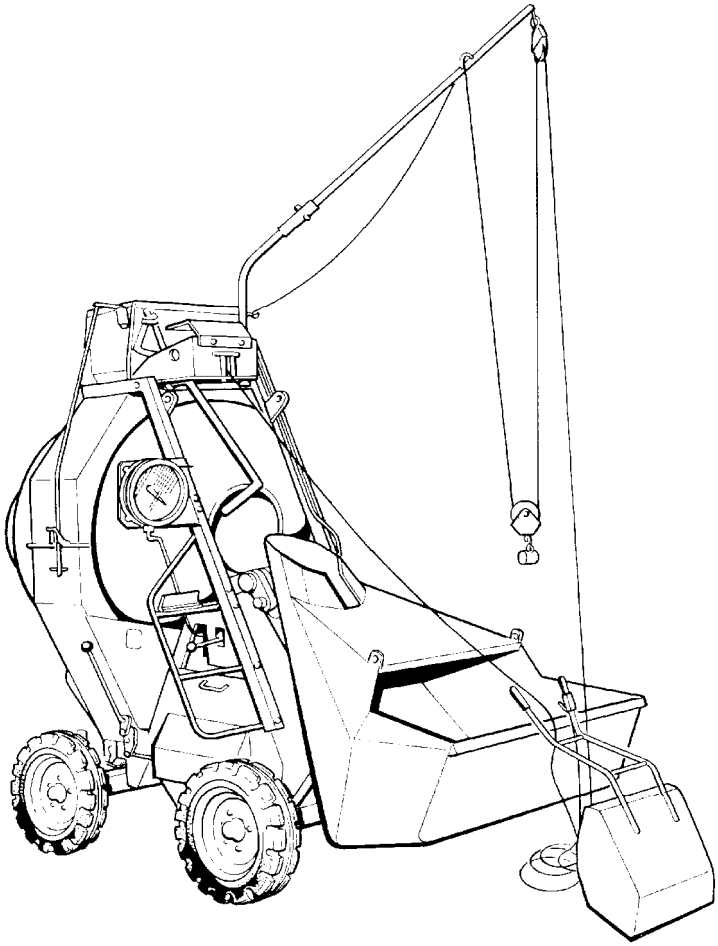
300R & 400R

SECTION 12

REVERSING GEARBOX MANUAL

WINGET

SERVICE MANUAL



REVERSING GEARBOX

FROM 1990

WWW.WINGET.CO.UK

INTRODUCTION

This manual covers the Reversing Gearbox installed into 300R, 400R and 500R Reversing Drum Mixers.

The following pages should enable a competent fitter/mechanic to fault find, repair or overhaul Reversing Gearboxes.

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Winget Limited operate a ploicy of continuous product development, therefore some illustrations or text within this publication may differ from your machine.

WORKSHOP MANUAL
300R 400R 500R
Winget Reversing Gearbox
From 1990

Asbestos Warning

The clutch linings within the gearbox may contain asbestos and suitable precautions should be taken to avoid inhaling the dust which should not be blown out with an airline. Dispose of old linings, dust, wipers etc safely.

Removal of Gearbox

Place the gearbox into neutral and removing the circlip, drift out the pivot pin and pull the operating fork and linkage clear of the gearbox plunger guide.

Disconnect the hydraulic hoses to the pump, plug the ports and hoses unbolt and remove the hydraulic pump taking care not to lose the shim pack.

Remove the ring of setscrews securing the propshaft to the gearbox output flange and lower the propshaft clear of the gearbox.

Unbolt the gearbox mounting bolts, disconnect the drive coupling between the engine/electric motor and using suitable lifting equipment lift the gearbox clear of the mainframe and support on a suitable worksurface.

Clean down the outer casing and place a suitable container below the drain plug. Remove the drain plug and allow the oil to drain. Refit the drain plug. Dispose of the oil safely and in accordance with local regulations covering the disposal of waste oil.

Disassembly of Gearbox

Remove the two 3/8 UNC self locking nuts and retaining washers, remove both the input and output flanges, it may be necessary to tap the flanges off the shafts using a soft faced mallet or suitable two or four leg puller taking care not to damage the flanges.

Remove the twelve 3/8 UNC headed screws securing the input pinion cartridge, output oil seal housing and plunger guide, note the four capscrews securing the pinion cartridge are shorter than those securing the oil seal housing and plunger guide.

Remove the cartridge, oil seal housing and plunger guide taking care not to lose or mix the shim packs. Remove both parallel keys from the pinion and output shaft and the loose pin located in the operating plunger.

Support the pinion cartridge in a soft faced vice and using a soft faced mallet tap the pinion out of the housing and remove the bearings, spacer and oil seal.

Remove the 3/8 UNC cap headed screws securing the two halves of the gearbox casing together and carefully prise the halves apart and lift the top half clear, note the two halves are dowelled together and care should be taken not to damage the mating surfaces when prising the casing apart.

Locate the operating pin in the centre of the cone clutches, remove the split pins and carefully drift out the pin, pull the operating plunger and shaft assembly out of the main shaft.

Remove the rubber “O” ring off the operating plunger and remove the internal circlip securing the operating shaft and bearing into the plunger. Secure the end of the operating shaft into a soft jawed vice, using a soft faced mallet tap the operating plunger off the shaft and bearing.

The bearing is a loose fit on the operating shaft and is retained by a countersunk plate and countersunk capheaded screw. Remove the screw, plate and bearing.

Using suitable lifting equipment lift the mainshaft, bevel gears and cone clutches out of the case. Remove the bearings, shims, bevel gears and cone clutches off the shaft, layout, clean and inspect all components for wear or damage.

Inspect the friction linings for wear (4.8mm when new), note production linings are bonded to the clutch faces, replacements are rivetted in place.

Clutch Lining Replacement

Clean all traces of the old clutch linings off the clutch cones (taking suitable precautions to avoid breathing in the dust which may contain asbestos fibres).

Slip the new friction linings onto the cones gently tapping fully home. Using the linings as a template drill the cones and insert the rivets. Using a suitable drift support the head of each rivet in turn and using a small ball pein hammer gently peen over the shank of the rivet on the inner face of the cone assembly. Repeat the operation until all the rivets are secure.

Re-assembly of Gearbox

Locate the bearing (3) onto the operating shaft (4) coat the threads of the countersunk screw (6) with loctite and retain the bearing using the screw and retaining plate (7). Note the bearing should be free to move on the shaft once the screw and plate are inplace.

Using a soft faced mallet tap the shaft and bearing assembly into the plunger (8) and retain with the circlip (5). Fit the rubber “O” ring (9) onto the plunger.

Locate the four circlips (11) into the bevel gears (10, 20) and insert the four outer cones of the taper roller bearings (13, 14, 16, 17) into the bevel gears as illustrated.

Slip the 0.5mm thick shim (19) over the main shaft (2) followed by the inner race of the taper roller bearing (17). Insert the mainshaft (2) into the bevel gear (20) and tap home the inner race of the taper roller bearings (15, 16) as illustrated.

Slide the cone clutch assembly (21) over the main shaft (2) aligning the drilled hole through the cone clutches with the slot machined in the mainshaft.

Loosely fit the outer cone of the bearing (15), lubricate the operating shaft (4) and insert into the centre of the mainshaft (2) align the hole in the operating shaft with the slot and holes in the mainshaft and cone clutch and fit the operating pin (22) retaining with the split pins (23).

Slip both the 1.00mm thick shim (18) and the 0.5mm thick shim (24) over the opposite end of the main shaft followed by the inner race of the taper roller bearing (14) locate the second bevel gear (10) over the mainshaft and fit the taper roller bearings (12, 13) as illustrated.

Carefully lift the assembly and locate into the lower half of the gearbox casing.

If removed refit the two dowel pins (27, 28) and coat the mating surfaces of the two halves of the gearbox case with a silicone sealer and secure the two halves together. Note do not tighten capscrews (25, 26, 29, 30, 31, 32) until assembly of the box is completed.

Lubricate and insert the pin (33) into the plunger (8). Select a 0.35mm thick shim pack (x) and fit over the plunger guide (34) coating the mating surfaces with a suitable silicone sealer. Install the plunger guide ensuring the machined slots in both the guide (34) and plunger (8) are aligned. Fit and tighten the four 3/8 x 1" UNC cap headed screws (35).

Select a 0.50mm thick shim pack (Y) and fit over the oil seal housing (36), install the housing and tighten two of the four 3/8 x 1" UNC capheaded screws (37).

Fit the feather key (39) and slide on the flange (41), rotate the shaft a few complete revolutions in either direction to seat the bearings then check the bearing pre-load.

The pre-load is best checked by winding a length of string tightly round the flange (41), attaching a spring balance and measuring the load required to turn the flange.

The preload is correct when a reading of around 1Kg is obtained.

If the preload is too low, remove the flange (41) and housing (36). Tap the shaft end with a soft faced mallet to release the loadings on the shaft and add additional 0.05, 0.125 or 0.25mm thick shims. Refit the housing and flange rotate the shaft then re-check the preload.

If the preload is too high, carry out the above procedure but reduce the shim pack thickness and re-check the preload.

If necesaary repeat the operations above until the preload obtained is correct.

When the preload reading is correct remove the flange (41) key (39) and housing (36). Using a suitable tool fit the oil seal (38) and lubricate the seal lips with a little grease. Coat the mating surfaces of the shim pack (Y) housing (36) and gearbox casing with a suitable silicone sealer and refit the housing securing with the four 3/8 x 1" UNC cap headed screws (37). Fit the feather key (39) and carefully refit the flange (41) taking care not to damage the oil seal. Secure the flange using the washer (40) and 5/8" UNC self locking nut (1).

Using a suitable bearing tube and soft faced hammer fit the bearing (43) onto the pinion (42). Slide on the spacer (44) and assemble the pinion, bearing and spacer into the cartridge (51). Stand the assembly on the head of the pinion and fit the bearing (45) and oil seal (46) lubricate the oil seal lips with a little grease. Insert the feather key (47).

Select a shim pack 0.50mm thick (52) and fit over the pinion cartridge (51) and insert the cartridge into the gearbox casing securing with the four 3/8" x 3/4" UNC cap headed screws (53). Fit the flange/pulley (50) onto the pinion and retain with the washer (49) and 5/8" UNC self locking nut (48). Turn the flange a few complete revolutions in each direction then check the pinion/bevel gear backlash.

To check the backlash reach through the hole in the gearbox casing and hold one of the two bevel gears (10, 20) preventing it from moving, with the other hand turn the flange (50) and check the backlash.

The backlash is best measured by placing a dial indicator against one of the holes in the flange/pulley (50).

The backlash is correct when the reading obtained on the dial indicator is 0.130/0.180mm.

If there is either no backlash or insufficient backlash, remove the pinion cartridge and increase the thickness of the shim pack then re-check the backlash with the dial indicator preventing the same bevel gear from moving.

If there is too much backlash, remove the pinion cartridge and decrease the thickness of the shim pack then recheck the backlash with the dial indicator preventing the same bevel gear from moving.

If necessary repeat the operations until the reading obtained by the dial indicator is correct. Note it is important that the backlash is checked on the same bevel gear each time the test is repeated.

Once the correct backlash reading is obtained slacken and remove the 5/8" UNC nut (48) and washer (49) remove the flange/pulley and pinion cartridge from the gearbox and coat the mating surfaces of the shim pack, gearbox case and pinion cartridge with a suitable silicone sealer and reassemble into the gearbox.

Check the backlash between the pinion and the second bevel gear (10, 20) it should be the same as the backlash on the first bevel gear on which the readings were taken.

If not the shimpack thickness at points “X” and “Y” should be adjusted by moving the excess shims from either “X” to “Y” or “Y” to “X”.

EXAMPLE

Backlash measured on bevel gear “A” item 20 is:-

0.13mm

Backlash measured on bevel gear “B” item 10 is:-

0.18mm

Difference between the two = 0.05mm

Divide by two, 0.025mm, remove 0.025mm from shim pack “Y” and add to “X”.

Backlash now equal at both “A” and “B” = 0.175mm.

Tighten the 3/8 UNC capscrews (25, 26, 29, 30, 31, 32) refit the oil drain plug and top up the gearbox oil using a good qualiity 20W/30 Engine Oil.

Note: Do not use Gear Oils, use of Gear Oils can prevent the cone clutches from operating correctly causing clutch slippage and premature failure of the linings.

Refit the level plug.

Refitting Gearbox

Using suitable lifting equipment sling the gearbox assembly and position within the mainframe.

If a dragline is fitted slip the dynamo drive belt over the gearbox drive pulley.

Shim up the gearbox ensuring the centre line of the engine and gearbox are aligned to avoid straining the drive couplings. Connect up the drive coupling between the engine and gearbox, tighten the gearbox down and refit the propshaft.

Reconnect the operating lever/fork fitting the pivot pin, retaining with the circlips.

Refit the hydraulic pump assembly, checking the backlash as described overleaf, reconnect the hoses etc.

Checking Hydraulic Pump Gear Backlash

The pump should be shimmed to give 5-8 thou (0.02-0.20mm) gear backlash.

Place the hydraulic pump onto the gearbox without any shims and measure the gap between the pump body and gearbox casting. Add 5-8 thou (0.02-0.20mm) to the measurement obtained and select a shim pack of the correct thickness.

Drum Clutch Adjustment

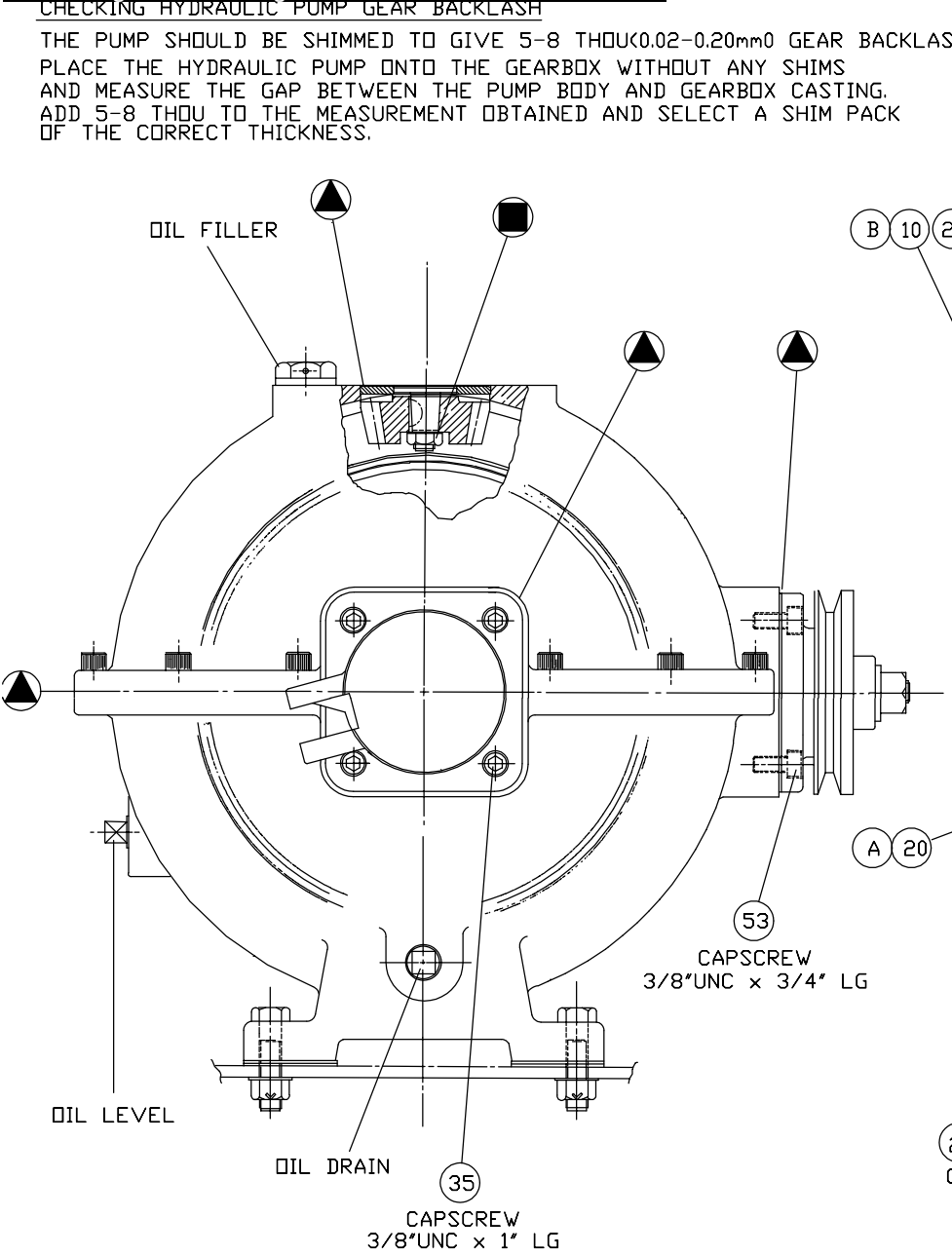
Set the handlever in the Mix/Charge position and rotate the nut on the connecting rod to allow 3mm of the short sliding gland to protrude beyond the end of the clevis assembly, tighten up the locking nut.

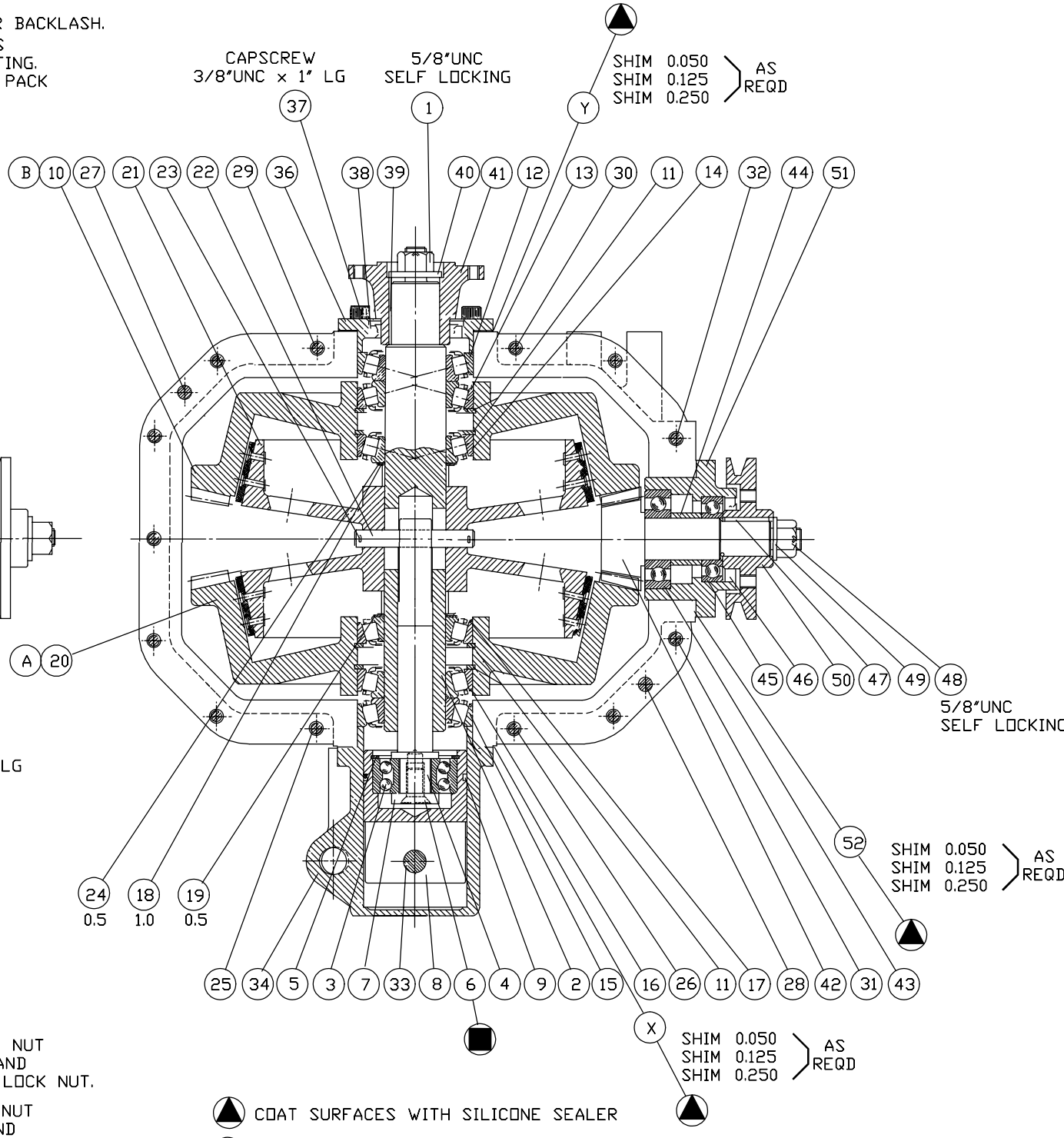
Set the handlever in the Discharge position and rotate the nut on the connecting rod to allow 3mm of the long sliding gland to protrude beyond the end of the clevis assembly, tighten up the locking nut.

Reversing Gearbox.dwg 04/03/02 15:42:10 Scaled to fit

CHECKING HYDRAULIC PUMP GEAR BACKLASH

THE PUMP SHOULD BE SHIMMED TO GIVE 5-8 THOU(0.02-0.20mm0 GEAR BACKLASH.
PLACE THE HYDRAULIC PUMP ONTO THE GEARBOX WITHOUT ANY SHIMS
AND MEASURE THE GAP BETWEEN THE PUMP BODY AND GEARBOX CASTING.
ADD 5-8 THOU TO THE MEASUREMENT OBTAINED AND SELECT A SHIM PACK
OF THE CORRECT THICKNESS.





DRUM CLUTCH ADJUSTMENT

SET THE HANDLEVER IN THE MIX/CHARGE POSITION AND ROTATE THE NUT
ON THE CONNECTING ROD TO ALLOW 3mm OF THE SHORT SLIDING GLAND
TO PROTRUDE BEYOND THE END OF THE CLEVIS ASSEMBLY, TIGHTEN LOCK NUT.

SET THE HANDLEVER IN THE DISCHARGE POSITION AND ROTATE THE NUT
ON THE CONNECTING ROD TO ALLOW 3mm OF THE LONG SLIDING GLAND
TO PROTRUDE BEYOND THE END OF THE CLEVIS ASSEMBLY, TIGHTEN LOCK NUT.

COAT SURFACES WITH SILICONE SEALER

APPLY "LOCTITE" THREADLOCK SPARINGLY

WORKSHOP MANUAL

300R & 400R

SECTION 13-18

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CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm